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# An exploration of values-consistent behaviour as an outcome, and its relationship with wellbeing.

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**Doctorate in Clinical Psychology**

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**Title of work:** An exploration of values-consistent behaviour as an outcome, and its relationship with wellbeing.

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**Lay summary**

This thesis contains two chapters involving research looking at values-consistent behaviour, which is about being the kind of person you want to be (e.g. a good parent, an active person) in areas of life that are important to you (e.g. family, health, work).

The first chapter reviewed studies on a type of psychological therapy called Acceptance and Commitment Therapy (ACT) to see if it helped people to be the kind of person they wanted to be. Some studies found that this therapy was helpful but other studies found that people who were waiting for treatment or had another type of treatment also got better at this whilst they were part of the study. The review also found that we need to do some more research to find out which questionnaires are best at measuring this kind of behaviour.

The second chapter describes a study involving 13-17 year olds completing one of these questionnaires. The results showed that young people who behaved as the kind of person they wanted to be had better wellbeing. However, it also showed that we might need to make some changes to this questionnaire to make it easier for young people to understand the instructions.

**Abstract**

This thesis is an exploration of values-consistent behaviour from a contextual behavioural science perspective. The first chapter is a systematic review of the effectiveness of acceptance and commitment therapy in enhancing values-consistent behaviour. The results from this review were inconclusive, mainly due to a lack of psychometrically robust outcome measures, and inconsistent use of available measures. Recommendations were made to improve the utility of measures of values-consistent behaviour**.** The second chapter reports a cross-sectional survey of adolescents, aimed at testing the psychometric properties of values measures, and assessing the relationship between values-consistent behaviour and wellbeing. The measures used in this study were the Valued Living Questionnaire 2 (VLQ-2), Portrait Values Questionnaire – Second Revision, Child and Adolescent Mindfulness Measure, Avoidance and Fusion Questionnaire for Youth – Short Form, and the Warwick-Edinburgh Mental Well-being Scale. Using the VLQ-2 in its current form, values-consistent behaviour was found to account for an additional 13% of variance in wellbeing, above the contributions of demographics, mindfulness and experiential avoidance. However, a recommendation was made for adaptions to be made to the VLQ-2 to make it more suitable for adolescents.

**The effectiveness of acceptance and commitment therapy in enhancing values-consistent behaviour: a systematic review.**

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*Prepared for submission to Behaviour Research & Therapy (see Appendix B for author guidelines).*

**Highlights**

- ACT might be effective in enhancing values-consistent behaviour.
- It is unclear if effects are greater for ACT compared with (in)active controls.
- There is insufficient high quality evidence to draw firm conclusions.

## Abstract

**Background:** Several systematic reviews have been conducted evaluating acceptance and commitment therapy (ACT), yet none used a theoretically consistent outcome. This review evaluated the effectiveness of ACT-based approaches in enhancing values-consistent behaviour compared with no treatment or alternative treatments for any participant group. **Method:** Randomised and non-randomised controlled trials using an acceptance based psychological intervention, specifically targeting and measuring values-consistent behaviour, were included. Multiple electronic sources were searched in (latest update) February 2016, and authors of included studies contacted in March-April 2016 to find published and unpublished studies. **Results:** The review includes 26 randomised and non-randomised controlled trials with a wide range of clinical and non-clinical adult populations. Most studies found a positive effect over time but this was not consistently greater than effects for the control groups. **Discussion:** The quality of the studies was considered to be poor overall, with particular concerns regarding the psychometric properties of available measures, as well as the administration, scoring and reporting of measures. **Conclusions:** There is currently insufficient high quality evidence to determine whether ACT enhances values-consistent behaviour. **Implications:** It is recommended that researchers use theoretically-driven outcome measures. Further development of appropriate measures is required. (PROSPERO registration: CRD42015015136).

## Keywords

acceptance and commitment therapy, systematic review, values, recovery, wellbeing

## Introduction

Several systematic reviews have explored the efficacy of acceptance and commitment therapy (ACT) with mixed results overall. Öst (2014) found no difference between ACT and cognitive behavioural therapy (CBT), and concluded that ACT could not be considered a well-established treatment for psychiatric disorders, somatic disorders and workplace stress. This contradicted previous findings from Ruiz (2012) who found greater mean effect sizes for ACT compared with CBT. More recently, A-Tjak et al. (2015) found ACT to be as effective as CBT for anxiety disorders, depression, addiction, and somatic health problems. Similarly, Hacker, Stone, and MacBeth (2016) found ACT to be effective in treating anxiety and depression but not more effective than CBT. Whilst these reviews have not indicated an unfavourable comparison between the two treatments, the results do not provide sufficient justification for the use of ACT over CBT, which is a well-established psychological treatment.

An important methodological limitation of these and other reviews of ACT to date is that the outcomes used to determine effectiveness or efficacy have focused on symptom reduction, whereas a key component of the ACT model is to shift the focus of treatment away from symptom reduction and towards the context and function of these symptoms (Hayes, 2004). Ruiz (2012) acknowledged that the comparison between CBT and ACT using measures of symptom reduction may not be a meaningful one, and that further research on ACT needs to evaluate primary outcomes of the intervention. This recommendation is consistent with guidance from the Centre for Reviews and Dissemination (CRD, 2009), which states that when

rating the choice of outcome measure as part of assessing the quality of a study, the relevance and meaning of the outcome to the intervention should be considered in addition to the psychometric properties of the measure.

One of the core aims of ACT is to "clear the path for a more vital, values consistent life" (Hayes, Luoma, Bond, Masuda, & Lillis, 2006, p.9). Based on relational frame theory, symptoms of physical and mental ill health are not themselves considered to be the problem, but instead the relationship the person has with those symptoms is thought to be the area where problems can arise (Hayes, 2004). Within this framework, it is recognised that suffering, whether physical or psychological, is a normal facet of the human experience, and psychological flexibility is needed in order to live a values-consistent life alongside this suffering. Consequently, rather than viewing symptoms as part of a disorder to be treated, ACT uses functional analysis with an emphasis on context to assess the workability of "problematic" behaviours in achieving desired goals (Hayes, Levin, Plumb-Vilardaga, Villatte, & Pistorello, 2013). This allows for a transdiagnostic and person-centred approach. The six core processes of ACT (acceptance, defusion, noticing self, being present, values, and committed action) are thought to be the mechanisms through which psychological flexibility can be increased to enable people to live a values-consistent life, and changes to symptoms are considered potential side-effects which may or may not occur. It therefore follows that one of the primary outcome measures for ACT research should be values-consistent behaviour rather than symptoms of disorders.

Gaudiano (2011) highlighted that there was a need to develop psychometrically sound tools in order to measure the behavioural change which ACT is designed to promote, which might explain why reviews have not captured the main outcome of interest. However, there have been some attempts to measure values-consistent living for use in clinical settings and within ACT research, including the Valued Living Questionnaire 1 and 2 (Wilson, Sandoz, Kitchens, & Roberts, 2010; Wilson & DuFrene, 2009), the Valuing Questionnaire (Smout, Davies, Burns, & Christie, 2014), the Chronic Pain Values Inventory (McCracken & Yang, 2006), the Bulls-Eyes Values Survey (Lundgren, Luoma, Dahl, Strosahl, & Melin, 2012), the Survey of Life Principles (Ciarrochi & Bailey, 2008), and the Engaged Living Scale (Trompetter et al., 2013). The increased availability of relevant measures is likely to have influenced the design of ACT studies in intervening years, and potentially be able to add to our understanding of the effectiveness of the intervention in line with its theoretical orientation.

### Objective

This review aimed to evaluate the effectiveness of ACT-based approaches in enhancing values-consistent behaviour in comparison with no treatment or alternative active treatments in any context in which it was applied.

## Method

### Protocol

The protocol for this review was registered with PROSPERO, http://www.crd.york.ac.uk/PROSPERO/, registration number

2015:CRD42015015136, where a record of changes during the course of the review is available for viewing.

Criteria for considering studies for this review

*Types of studies*

- Inclusion criteria: randomised controlled trials and non-randomised trials including a comparison group reported any time prior to April 2016 were considered in this review. Published studies and grey literature were considered.
- Exclusion criteria: uncontrolled trials, case series and case studies were excluded. Due to resource limitations, only studies reported in English were considered.

*Types of participants*

- Inclusion criteria: to allow for the transdiagnostic approach used within ACT, and the wide range of settings in which it has been applied, studies involving adults of any age, children and adolescents in clinical and non-clinical settings, with or without health/mental health difficulties were included.
- Exclusion criteria: none.

*Types of interventions*

- Inclusion criteria: ACT, including interventions utilising the core processes of ACT but described in other ways such as acceptance based behavioural

therapy. As a minimum, the intervention was required to actively attempt to enhance values-consistent behaviour.

- Exclusion criteria: interventions which were described as ACT which used some of the core processes of the theoretical model but did not actively seek to enhance values-consistent behaviour.

*Types of outcome measures*

- Primary outcomes: values-consistent behaviour, including where this was intended for use and reported as a secondary outcome or process measure. Any self-report measures that allowed for the participants to rate their success in living according to values (e.g. Bull's Eye Values Survey, Valued Living Questionnaire, Chronic Pain Values Inventory) were included for this review. Pre- and post-intervention and/or pre-intervention and follow-up comparisons using a suitable measure were required for inclusion in the review. Authors were contacted for this information where this was not reported. Where multiple follow-up assessments were conducted, only data from the final time point were considered.
- Secondary outcomes: none

Search methods for identification of studies

*Electronic database searches*

Following consultation with a librarian experienced in searches for systematic reviews, initial searches were conducted in May 2015 and updated in February 2016, except where otherwise stated.

The OVID gateway was used to search the following databases: EMBASE 1980-2015 week 19, PsycINFO 1806 to May week 1 2015, OVID MEDLINE(R) 1946 to May week 1 2015, and AMED (Allied and Complementary Medicine) 1985 to May 2015 using the keywords “acceptance and commitment therapy” OR “acceptance-based” OR “acceptance based” OR “acceptance therapy” OR “ABBT”.

Ebsco host was used to search CINAHL Plus and ERIC using the terms “acceptance and commitment therapy” OR “acceptance-based” OR “acceptance therapy” OR “ABBT” applied to abstracts.

Proquest was used to search the following databases: Applied Social Sciences Index and Abstracts (ASSIA) (1987 - current), Social Services Abstracts (1979 - current), Sociological Abstracts (1952 - current), and ProQuest Dissertations & Theses Global using the terms “acceptance and commitment therapy” OR “acceptance-based” OR “acceptance based” OR “acceptance therapy” OR “ABBT” using the search option “anywhere except full text”.

Web of Science core collection was searched for results from the Conference Proceedings Citation Index- Science (CPCI-S) 1990-present, and the Conference Proceedings Citation Index- Social Science & Humanities (CPCI-SSH) 1990-present using the terms: TS=(“acceptance and commitment therapy” OR “acceptance-based” OR “acceptance based” OR “acceptance therapy” OR “ABBT”) or TI=(“acceptance

and commitment therapy" OR "acceptance-based" OR "acceptance based" OR "acceptance therapy" OR "ABBT").

Scopus was searched using the terms: TITLE-ABS ("acceptance and commitment therapy" OR "acceptance-based" PRE/2 therapy OR treatment OR intervention OR "acceptance therapy" OR "ABBT").

Open Grey was searched using the terms: "acceptance and commitment therapy" OR "acceptance-based" OR "acceptance based" or "acceptance therapy" OR "ABBT".

*Other sources*

- *Websites:* The publications list on the website for the Association of Contextual Behavior Science, the organisation associated with the development of ACT (www.contextualscience.org), was searched in January 2016 using the option "ACT: Empirical".
- *References lists:* The references of relevant reviews found through the database searches were checked for additional studies.
- *Personal communication:* where contact details were available, first authors of eligible studies were contacted in March-April 2016 to ask if they were aware of any additional studies that may have been missed. Any responses received prior to mid-April 2016 were considered for inclusion in the review.

## Data collection and analysis

### *Selection of studies*

The first author screened the studies from the search against the inclusion criteria. Results were initially extracted based on whether the title and/or abstract suggested that the study involved an ACT intervention. Full articles were then checked, first for an appropriate measure of values-consistent behaviour, then for an appropriate design and intervention.

### *Data extraction and management*

Data were extracted by the first author using a data extraction form designed specifically for this study to include the following information: author, publication date, design (randomised or non-randomised), nature of the intervention and control group, age, gender, sample size, intervention duration and follow-up period, and outcome measure.

### *Assessment of methodological quality of included studies*

Given the unusual nature of this review in its focus on a particular outcome rather than a disorder or participant group, existing risk of bias/quality assessment tools were considered unsuitable. Consequently, items from existing tools were considered and adapted where appropriate by the authors to create a set of quality criteria which could assess each study's ability to address the review question. The full set of criteria and scoring system can be seen in Appendix A. The first author assessed all studies for quality.

*Measures of treatment effect*

Due to the heterogeneity of the studies and the way the outcomes were reported, it was not considered appropriate to calculate effect sizes. Treatment effects have therefore been presented as they were reported.

*Data synthesis*

The issues outlined above in relation to treatment effects also precluded a quantitative synthesis of the results. Consequently, a narrative synthesis has been used to summarise the main findings within the included studies.

## Results

Description of studies

*Results of the search*

Figure 1 outlines the number of studies considered at each stage. A total of 2,522 unique results were found.

*Excluded studies*

As can be seen in Figure 1, 2,012 search results were rejected at the stage of screening titles and abstracts. Lack of an appropriate outcome measure was the main reason for rejection when considering full texts.

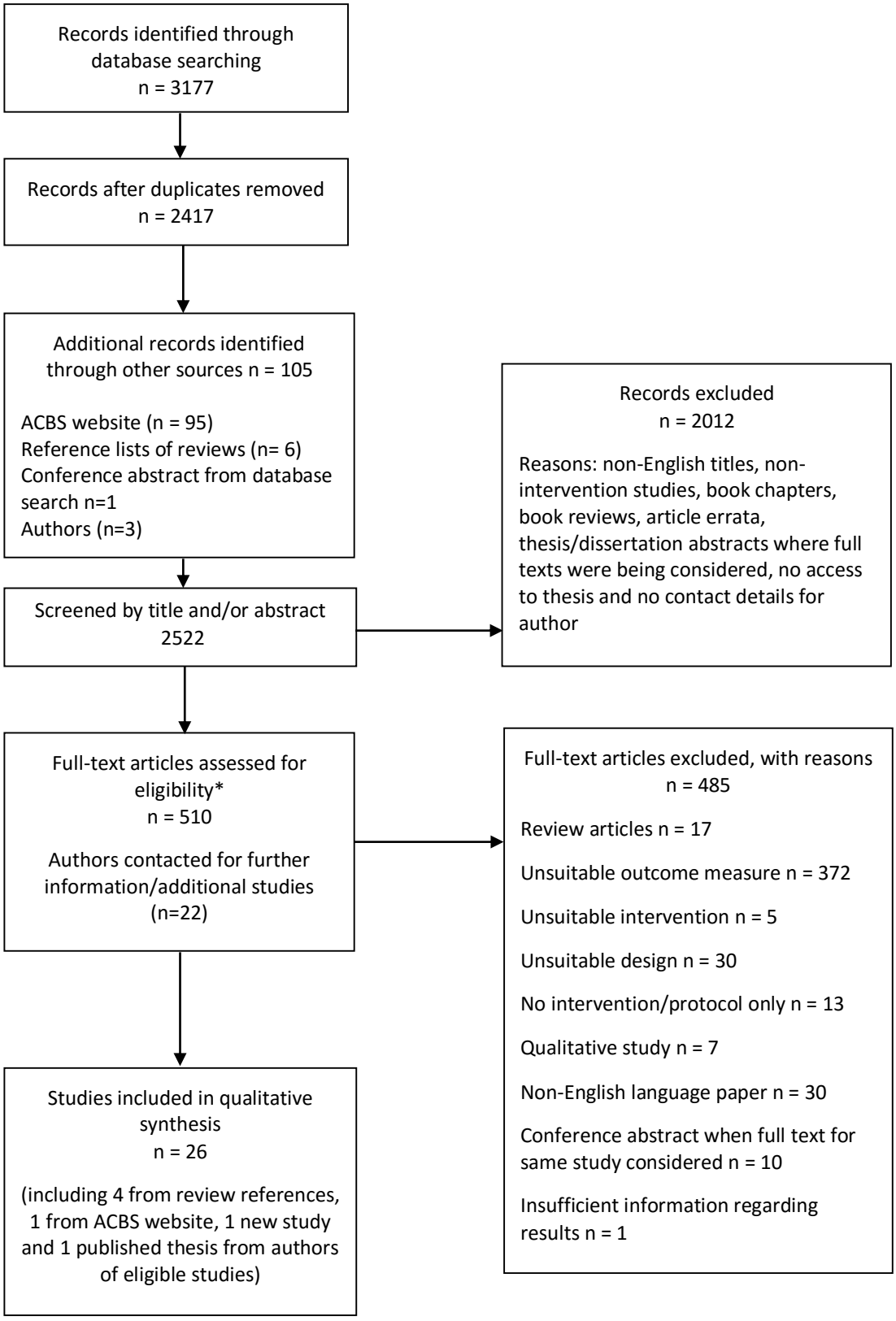


Figure 1. Number of studies considered at each stage of the screening process.

* During the early stages of the review process, all study designs were being considered, leading to a large number of full texts being assessed.

*Included studies*

Summary characteristics of included studies can be seen in Table 1. Twenty six studies met full inclusion criteria. Of these, 11 were unpublished thesis projects (some of these theses had associated publications that did not include information about the outcome measure of interest). Twenty studies were RCTs, which used a waiting list control (seven studies), an alternative active treatment/treatment as usual control (12 studies) or both (one study). Of the non-RCTs, the control groups were: waiting list (two studies), no intervention (three studies) or a similar intervention without a values focus (one study). All studies were conducted with adult (18 years and over) populations. The ACT interventions were delivered in a variety of formats, and ranged in duration from one to 16 sessions. Some of these interventions were used as adjuncts to other treatments. The Valued Living Questionnaire 1 (VLQ 1) was the most commonly used (12 studies) measure of values consistent behaviour. The percentage of females in each condition ranged from 44.5-100%. Follow up periods ranged from zero to six months.

Methodological quality of included studies

Ratings for the quality of eligible studies can be seen in Table 2, as summarised in Figure 2. The majority of the studies used a detailed protocol for the ACT intervention, and the remaining studies were considered to have provided an adequate level of detail about the intervention to allow for study replication. Only 11 studies had at least an adequate follow up period. For the outcome measures, test-retest reliability data was only available for the VLQ and the BEVS. For those measures, the alpha level was sufficient to be considered good but the choice of

Table 1. Summary of included studies

| Study | Design | Intervention | Mean age (SD) | Sample size[a] (% female[b]) | Participant group | Duration | Follow-up | Measure |
|---|---|---|---|---|---|---|---|---|
| **Alonso et al. (2013)** | RCT | Group ACT + selective optimisation and compensation | 87 (2.44) | 5 (80) | Older people with chronic pain | 10 sessions x 2hrs over 5 weeks | none | CPVI |
| | | ***Waitlist*** | ***83.8 (3.82)*** | ***5 (80)*** | | | | |
| **Bordieri (2009)*** | RCT | 1-1 ACT + daily self-monitoring and weekly goal setting | 50 (13.36) | 9 (88.9) | Obese adults | 8 weekly sessions | none | VLQ 1 |
| | | ***Waitlist*** | ***47.4 (13.63)*** | ***10 (100)*** | | | | |
| **Clarke et al. (2015)** | RCT | ACT workshops | 41.47 (9.10) | 77 (72.2) | Staff caring for clients with a personality disorder | 2 day workshop | 6 months | VLQ 1 |
| | | ***Psychoeducation*** | ***38.30 (9.19)*** | ***63 (77.6)*** | | ***As above*** | | |
| **Danitz & Orsillo (2014)** | RCT | ABBT workshop | Study completers 21.13 | 49 (79.6 overall of study completers) | First year undergraduate students and law students | 1.5h session + 3 post-workshop email/text messages ~ 3 weeks apart | none | VLQ 1 – education domain only |
| | | ***Waitlist*** | **(4.73)** | ***49*** | | | | |
| **Fletcher (2011)*** | RCT | ACT workshop | 53.1 (11.1) | 36 (80.6) | Obese adults | 6 hours | 3 months | BEVS |
| | | ***Waitlist*** | ***52.1 (12.6)*** | ***36 (86.1)*** | | | | |
| **Hildebrandt (2014)*** | RCT | ACT-enhanced disease education | 65.2 (8) | 32 (75 overall) | Adults over 35 with hypertension | 30 min education session + 4 weekly 1 hr sessions | 3 months | BEVS |
| | | ***Disease education with supportive instruction*** | | ***32*** | | ***As above*** | | |
| **Hinton (2012)*** | RCT | ACT group | 19.38 (1.72) | 21 (66.7) | Students with depression and low self-esteem | 6 weekly 1 hour sessions | 3 months | VLQ 1 |
| | | ***Supportive therapy group*** | ***23.08 (7.97)*** | ***13 (76.9)*** | | ***As above*** | | |

| Study | Design | Intervention | Mean age (SD) | Sample size[a] (% female[b]) | Participant group | Duration | Follow-up | Measure |
|---|---|---|---|---|---|---|---|---|
| **Johnston et al. (2010)** | RCT | ACT self-help book + weekly telephone support | median 43 (range 20-84) | 12 (75) | Adults with chronic pain | 6 weeks | none | CPVI |
| | | ***Waitlist with weekly phone calls*** | | ***12 (50)*** | | | | |
| **Karekla (2004)*** | RCT | Acceptance enhance panic control treatment | 34.95 (11.07) | 14 (77 overall) | Panic disorder | 10 weekly 90 minute sessions | 6 months | VLQ 1 |
| | | ***Panic control treatment*** | | ***14*** | | ***As above*** | | |
| **Kingston (2008)*** | RCT | ACT group | 44.5 | 20 (65) | Treatment resistant | 16 weekly 2hr sessions | 6 months | VLQ-1# |
| | | ***CBT-TAU group*** | ***44.35*** | ***20 (55)*** | | ***As above*** | | |
| **Kocovski et al. (2013)** | RCT | MAGT | 34.94 (12.52) | 53 (49.1) | Social anxiety disorder | 12 weekly 2hr sessions (+3 month follow-up/check-in session) | 3 months (MAGT & CBT only) | VLQ 1 |
| | | ***CBT group*** | ***32.66 (9.07)*** | ***53 (52.8)*** | | | | |
| | | ***Waitlist*** | ***35.55 (11.58)*** | ***31 (64.5)*** | | ***As above*** | | |
| **Kristjánsdóttir et al. (2013)** | RCT | ACT-based smartphone intervention add-on to the inpatient programme | 44.59 (11.13) | 69 (100) | Adult females with chronic pain | 8 weeks (continued for 4 weeks post-discharge) | 5 months | CPVI |
| | | ***Inpatient multidimensional rehabilitation programme for chronic pain*** | ***43.80 (11.20)*** | ***66 (100)*** | | ***4 weeks*** | | |

| Study | Design | Intervention | Mean age (SD) | Sample size[a] (% female[b]) | Participant group | Duration | Follow-up | Measure |
|---|---|---|---|---|---|---|---|---|
| **Levin et al. (2014)** | RCT | ACT-based web programme<br>***Waitlist*** | 18.37 (0.54) | 37 (53.9 overall)<br>***39*** | University students | 2 lessons over 3 weeks | 3 weeks for ACT group only | PVQ - relationship and education domains only |
| **Levin et al. (2016) and thesis** | RCT | ACT-based web programme<br>***Psychoeducation web programme*** | 21.61 (5.48) | 110 (76.9 overall)<br>***118*** | University students | 2 lessons over 3 weeks<br>***As above*** | 3 months | PVQ – relationship and education domains only |
| **Lundgren (2004)*** | RCT | ACT (group & 1-1)<br>***Attention control (group & individual)*** | 38.85<br>***42.5*** | 15 (46.7)<br>***13 (50)*** | Adults with epilepsy | 3 sessions (1-3hrs each)<br>***As above*** | none | BEVS |
| **Moffitt & Mohr (2015)** | RCT | ACT DVD + pedometer-based walking program<br>***Walking program*** | 43.47 (12.21)<br>***43.93 (10.33)*** | 39 (84.4)<br>***37 (81.5)*** | Low physical activity groups | DVD Intro + 5 modules 15-25mins each/12 weeks walking<br>***12 weeks*** | none | VLQ 1 – health domain only |
| **Pankey (2008)*** | RCT | ACT group<br>***TAU case management*** | 29.17 (7.36)<br>***27.91 (9.08)*** | 12 (58.3)<br>***11 (45.5)*** | Intellectual disability + axis I disorder | 4 weekly 1.5hr sessions<br>***4 weeks (≥1hr/week)*** | 1 month | BEVS modified |
| **Plumb Vilardaga (2012)*** | RCT | ACT group + self-help book<br>***Waitlist*** | 52.29 (12.99) | 15 (75 overall)<br>*13* | Chronic pain | 6 weekly 2hr sessions | 4 months (ACT group only) | BEVS |
| **Steiner (2013) and thesis** | RCT | 1-1 ACT | 48.63 (12.96) | 18 (100)<br>***15 (100)*** | Women with fibromyalgia | 6-10 weekly 1hr sessions<br>***As above*** | 12 weeks | CPVI – relationship, family, work |

| Study | Design | Intervention | Mean age (SD) | Sample size[a] (% female[b]) | Participant group | Duration | Follow-up | Measure |
|---|---|---|---|---|---|---|---|---|
| | | ***1-1 Pain management education*** | | | | | | domains only |
| **Zargar et al. (2013)** | RCT | ABBT<br><br>***Applied relaxation*** | 34.5 (7.24)<br><br>***42.7 (9.41)*** | 11 (100)<br><br>***11 (100)*** | Women with generalised anxiety disorder | 12 weekly 90 mins sessions<br>***12 weekly sessions*** | none | VLQ 1 translation |
| **Danitz et al. (in press)** | Non-randomised | ABBT workshop<br><br>***Health & wellness module*** | 18.1 (0.3)<br><br>18.1 (0.4) | 119 (71.6)<br><br>***94 (69.5)*** | Undergraduate students completing a first year experience course | 75 minute workshop + 3 emails at 3 week intervals | none | VLQ 1 – education domain only |
| **Emery (2011)*** | Non-randomised | ACT workshop<br>***Waitlist*** | 47 | 58 (82.9) | Teachers | 6 hrs + emails at 4 and 8 weeks post workshop | 3 months | PVQ – work domain only |
| **Hahs (2013)*** | Non-randomised | ACT group<br>***No intervention*** | 43.8 (4.63)<br>***47.2 (7.22)*** | 9 (77.8)<br>***9 (66.7)*** | Parents of children with ASD | 2 approx. weekly 2hr sessions | none | PVQ II |
| **Maclean (2013)*** | Non-randomised | ACT group<br>***No intervention*** | 48.32<br>***41.9*** | 25 (92)<br>***20 (90)*** | NHS mental health staff | 3 sessions 2-4 weeks apart | none | VQ |
| **Michelson et al. (2011)** | Non-randomised | ABBT (1-1)<br><br>***No intervention*** | 35.20 (11.06)<br><br>***32.03 (10.41)*** | 30 (53)<br><br>***30 (53)*** | Generalised anxiety disorder<br>***Non-clinical matched controls*** | 16 sessions | none | VLQ 1 |
| **Stafford-Brown & Pakenham (2012)** | Non-randomised | ACT group<br>***Waitlist*** | 28.79 (8.99)<br>***28.11 (7.59)*** | 28 (89.3)<br>***28 (85.7)*** | Clinical psychology trainees | 4 weekly 3hr sessions | 10 weeks | VLQ 1 |

* Unpublished thesis, [a] based on number allocated to each group, [b] based on available demographic information rather than allocated participants, # described as VLQ-R in the manuscript, TAU = treatment as usual, MAGT = mindfulness and acceptance group therapy, ABBT = acceptance based behaviour therapy, VLQ= Valued Living Questionnaire, BEVS = Bulls-Eye Values Survey, PVQ = Personal Values Questionnaire, VQ = Valuing Questionnaire, CPVI = Chronic Pain Values Inventory

Table 2. Quality ratings for included studies.

| Study | Sample size (1) | Sample size (2) | Comparison group | Protocol | Fidelity | Reliability | Scoring & reporting | Follow up | Attrition (1) | Attrition (2) | Missing data | Adjusted analyses | Overall risk of bias |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Alonso et al. (2013)** | Poor / not known / N/A | Poor / not known / N/A | Adequate | Good | Poor / not known / N/A | Poor / not known / N/A | Good | Poor / not known / N/A | Adequate | Poor / not known / N/A | Poor / not known / N/A | Poor / not known / N/A | High |
| **Bordieri (2009)*** | Poor / not known / N/A | Adequate | Adequate | Adequate | Poor / not known / N/A | Adequate | Good | Poor / not known / N/A | Good | Poor / not known / N/A | Poor / not known / N/A | Good | High |
| **Clarke et al. (2015)** | Good | Good | Good | Adequate | Poor / not known / N/A | Adequate | Poor / not known / N/A | Good | Adequate | Poor / not known / N/A | Good | Good | High |
| **Danitz & Orsillo (2014)** | Good | Good | Adequate | Good | Poor / not known / N/A | Adequate | Adequate | Poor / not known / N/A | Poor / not known / N/A | Poor / not known / N/A | Good | Good | High |
| **Fletcher (2011)*** | Good | Good | Adequate | Good | Good | Adequate | Good | Adequate | Good | Good | Good | Poor / not known / N/A | High |
| **Hildebrandt (2014)*** | Good | Good | Good | Good | Good | Adequate | Adequate | Adequate | Good | Adequate | Good | Good | Low |
| **Hinton (2012)*** | Adequate | Adequate | Adequate | Good | Good | Adequate | Good | Adequate | Good | Poor / not known / N/A | Good | Poor / not known / N/A | High |
| **Johnston et al. (2010)** | Adequate | Adequate | Adequate | Good | Adequate | Poor / not known / N/A | Adequate | Poor / not known / N/A | Adequate | Poor / not known / N/A | Adequate | Adequate | Unclear |
| **Karekla (2004)*** | Adequate | Adequate | Adequate | Good | Poor / not known / N/A | Adequate | Good | Good | Poor / not known / N/A | Poor / not known / N/A | Adequate | Poor / not known / N/A | High |
| **Kingston (2008)*** | Adequate | Good | Good | Good | Adequate | Adequate | Poor / not known / N/A | Good | Adequate | Adequate | Poor / not known / N/A | Poor / not known / N/A | High |
| **Kocovski et al. (2013)** | Good | Good | Adequate | Good | Good | Adequate | Good | Good | Adequate | Adequate | Good | Good | Low |
| **Kristjánsdóttir (2013)** | Good | Good | Adequate | Good | Adequate | Poor / not known / N/A | Adequate | Adequate | Adequate | Adequate | Poor / not known / N/A | Poor / not known / N/A | High |
| **Levin et al. (2014)** | Good | Good | Adequate | Good | Adequate | Poor / not known / N/A | Poor / not known / N/A | Poor / not known / N/A | Good | Good | Good | Good | Unclear |

| Study | Sample size (1) | Sample size (2) | Comparison group | Protocol | Fidelity | Reliability | Scoring & reporting | Follow up | Attrition (1) | Attrition (2) | Missing data | Adjusted analyses | Overall risk of bias |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Levin (2016)** | Good | Good | Good | Good | Poor / not known / N/A | Poor / not known / N/A | Poor / not known / N/A | Adequate | Adequate | Adequate | Good | Good | Unclear |
| **Lundgren (2004)*** | Adequate | Good | Good | Good | Poor / not known / N/A | Adequate | Good | Poor / not known / N/A | Good | Poor / not known / N/A | Poor / not known / N/A | Poor / not known / N/A | High |
| **Moffitt & Mohr (2015)** | Good | Good | Good | Good | Poor / not known / N/A | Adequate | Poor / not known / N/A | Poor / not known / N/A | Good | Poor / not known / N/A | Poor / not known / N/A | Good | High |
| **Pankey (2008)*** | Adequate | Adequate | Good | Good | Good | Poor / not known / N/A | Good | Poor / not known / N/A | Good | Poor / not known / N/A | Poor / not known / N/A | Good | High |
| **Plumb Vilardaga (2012)*** | Adequate | Adequate | Adequate | Good | Good | Adequate | Good | Adequate | Adequate | Poor / not known / N/A | Good | Poor / not known / N/A | High |
| **Steiner (2013) & thesis** | Adequate | Good | Adequate | Good | Adequate | Poor / not known / N/A | Poor / not known / N/A | Adequate | Good | Good | Good | Good | Unclear |
| **Zargar et al. (2013)** | Poor / not known / N/A | Adequate | Adequate | Good | Poor / not known / N/A | Adequate | Good | Poor / not known / N/A | Good | Poor / not known / N/A | Poor / not known / N/A | Good | High |
| **Danitz et al. (in press)** | Good | Good | Adequate | Adequate | Poor / not known / N/A | Adequate | Poor / not known / N/A | Poor / not known / N/A | Adequate | Poor / not known / N/A | Good | Good | High |
| **Emery (2011)*** | Adequate | Good | Adequate | Good | Good | Poor / not known / N/A | Poor / not known / N/A | Adequate | Adequate | Adequate | Poor / not known / N/A | Poor / not known / N/A | High |
| **Hahs (2013)*** | Poor / not known / N/A | Adequate | Adequate | Good | Adequate | Poor / not known / N/A | Poor / not known / N/A | Poor / not known / N/A | Good | Poor / not known / N/A | Poor / not known / N/A | Poor / not known / N/A | High |
| **Maclean (2013)*** | Adequate | Good | Adequate | Good | Adequate | Poor / not known / N/A | Poor / not known / N/A | Poor / not known / N/A | Good | Poor / not known / N/A | Good | Poor / not known / N/A | High |
| **Michelson et al. (2011)** | Good | Good | Poor / not known / N/A | Adequate | Poor / not known / N/A | Adequate | Good | Poor / not known / N/A | Adequate | Poor / not known / N/A | Poor / not known / N/A | Poor / not known / N/A | High |
| **Stafford-Brown & Pakenham (2012)** | Good | Good | Adequate | Good | Adequate | Adequate | Good | Poor / not known / N/A | Good | Good | Adequate | Poor / not known / N/A | High |

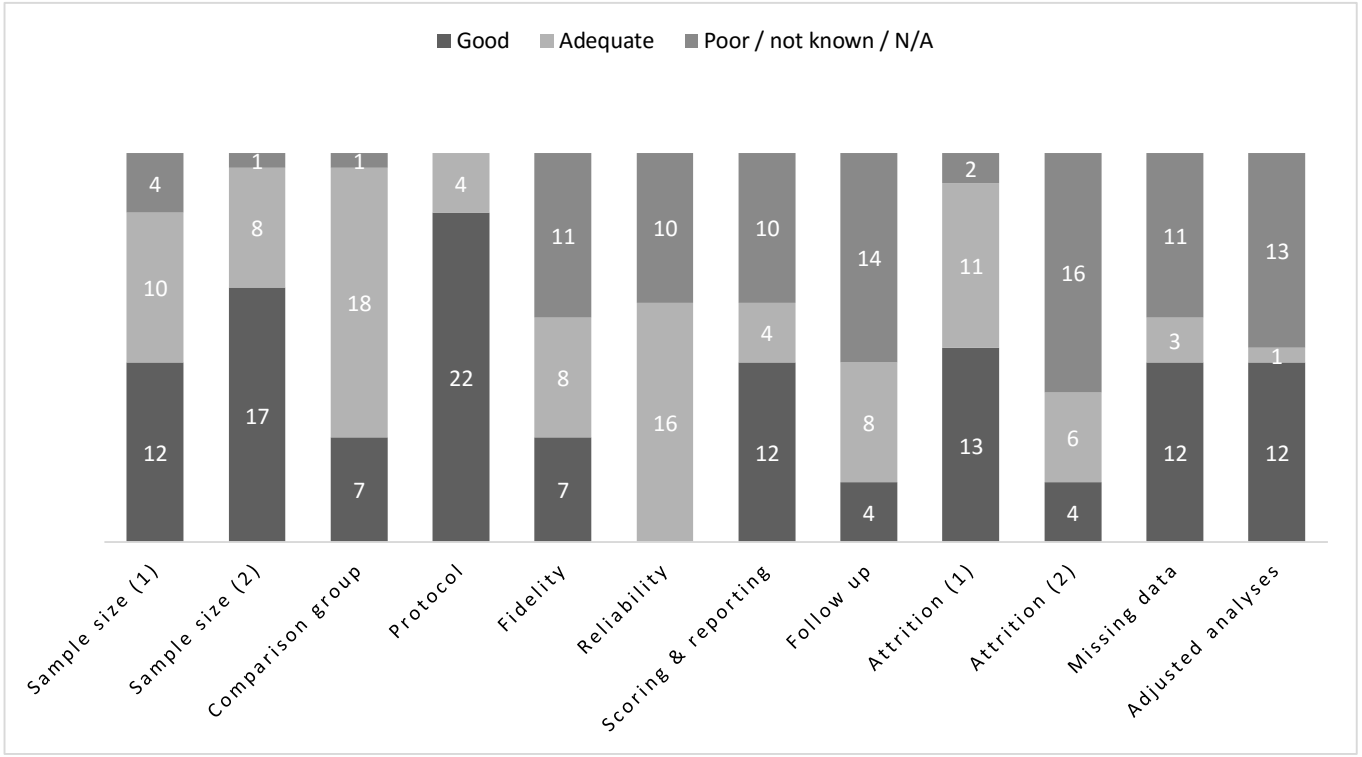


Figure 2. Summary of quality criteria ratings

Table 3. Summary of treatment effects for values-consistent behaviour

| Study | Pre-post change | Pre-followup change | Inter group differences |
|---|---|---|---|
| **Alonso et al. (2013)** | **Improvement for both groups on success p<.05, and discrepancy p>.10.** | **n/a** | Success: U=11.0, p>.10<br>Discrepancy: U=8.50, p>.10<br>**No between group differences in improvement** |
| **Bordieri (2009)*** | Improvement for ACT p=.254, d=.03 and control p=.638, d=.17 | **n/a** | **p=.796 d=-.35**<br>**No differences in improvement across groups** |
| **Clarke et al. (2015)** | **Improvement for ACT p = .012** and control (unknown p value) | Improvement returned to near pre-intervention levels at 6-month follow-up<br>Improvement reversed at follow up | a significant main effect of time, F(2, 78.84) = 3.26, p = .044, **but no significant Group × Time interaction.** |
| **Danitz & Orsillo (2014)** | Improvement for ACT, deterioration for control | **n/a** | F(1, 42) = 3.4, p = .07, (d = .55)<br>**Possible time x group interaction** |
| **Fletcher (2011)*** | **Significant improvements for ACT on barriers (p=.049), work/education (p=.027), leisure (p=.046), health (p=.002);** no significant improvements for control | **Significant improvements for ACT on work/education (p=.002), leisure (p=.047), health (p=.021), relationships (p=.05); significant improvements for control on barriers (p=.020), leisure (p=.019).** | **Greater improvements for ACT group at post intervention for barriers (p=.012) and health (p=.049).**<br>**Greater improvements for ACT group at follow up for work/education (p=.026).** |
| **Hildebrandt (2014)*** | Improvement for ACT t(52.79) = -1.21 p = .233 and **control t(53.86) = -3.06 p = .003** | **Improvement for ACT t(50.97) = -3.69 p = .001 and control t(55.31) = -5.41 p = .000** | **Possible medium effect for time [F(1,43.62) = 3.87, p = .056, effect size = .60],** but no significant effect for treatment condition (p > .25) or time-by-condition interaction (p > .25). |
| **Hinton (2012)*** | Improvement for both d=.03 | Improvement for both d=.65<br>**Significant effect of time** | |
| **Johnston et al. (2010)** | Improvement for both groups, greater for ACT group d=0.54, p>.05 | **n/a** | **main effect of time** (F= 15.74, p**η2=**0.57, p,.05), no time x group interaction (F= .01 p**η2=**.01) |
| **Karekla (2004)*** | | **Overall time effect of improvement F ( l , 4) = 15.61,p <.05, η2= .80.** | **a significant Group x Time interaction, F (3, 12) = 3.60, p <.05, η2= .47.**<br>**ACT>control at post-intervention, p<.01** |

| Study | Pre-post change | Pre-followup change | Inter group differences |
|---|---|---|---|
| **Kingston (2008)*** | Improvement for both groups | Improvement for both groups | **Main effect of time** F(1,26) = 4.08, p<.05, no significant effect of group or time x group interaction |
| **Kocovski et al. (2013)** | Improvement for both active groups only; deterioration for waitlist control | **n/a** | **There was a post-treatment group effect of F(2, 133)=5.34, p<.01 (both active groups had higher VLQ scores than the waitlist control)** |
| **Kristjánsdóttir et al. (2013)** | Pre-post improvements for both groups. **Discharge (mid intervention) to post-intervention improvement for ACT group d=0.52, p<.01** but not control d=0.28, p<.12 | Pre-followup improvements for both. Discharge (mid intervention) to follow-up: no change for ACT group d=0.16, p<.25 and **a decrease for control d=-0.63, p=.01** | **Group effects (ACT>control) at post-intervention d=0.63, p<.01**; and a trend at follow up d=0.40, p=.08 |
| **Levin et al. (2014)** | Improvement for the ACT group for relationship and education success; improvement for control group on relationship success only | ( p < .10) within-group improvement effects in the ACT-CL condition from pre to follow-up for education **((slope estimate = .16, t =2.33, p = .033, d=.92),** and relationship success **((slope estimate = .13, t =2.10, p = .043, d=.78),** | **Time x group interaction for education values success, F(1, 71.94) = 5.31, p = .024, Cohen's d = .54; and positive motivation for education, F(1, 72.01)=4.62, p=.035, Cohen's d =.51.** p < .10 between-group effects from pre to post for education success (ACT > control) |
| **Levin (2016)** | Improvement for both groups for relationship success (time effect F(1, 196.54) = 6.80, p = .01, d = .37; **ACT t(394.79) = 2.29, p = .02, Cohen's d = .27**; Control p>.10), and education success (time effect F(1, 193.30) = 3.28, p = .07, Cohen's d = .26, ACT p>.10; **Control slope estimate = .20, t(185.49) = 2.08, p = .04**)) | Trend for improvement for both groups for relationship success (time effect F(3, 168.66) = 2.65, p = .051). Education success improved for control group **((slope estimate = .26, t(154.96) = 2.12, p = .04),** and deteriorated for the ACT group p>.10 | There was a trend for a time by condition interaction for education values success from pre to 3-month follow-up, F(3, 168.81) = 2.22, p = .088, Cohen's d = .23. There was a trend for a time by condition interaction for education values success from pre to 3-month follow-up, F(3, 168.81) = 2.22, p = .088, Cohen's d = .23. A trend for a time x condition interaction for education values success from pre to 3-month follow-up in the full sample, F(3, 168.81) = 2.22, p = .088, Cohen's d = .23. Post hoc analyses indicated **significantly** |

| Study | Pre-post change | Pre-followup change | Inter group differences |
|---|---|---|---|
| | | | **higher education values success in the education condition compared with ACT-CL, estimate = −.35, t(158.05) = −1.99, p = .049, Cohen's d = .32.** Among participants who completed both sessions (ACT-CL, n = 61, education, n = 101), there was not a trend for a time x condition interaction (p > .10). |
| **Lundgren (2004)*** | Improvements on index and persistence scores for both groups, **ACT group p<.01**. | **n/a** | **Index score time x group interaction ANOVA F (1.26)= 61.85; p< .01. Persistence score time x group interaction F (1.26)= 43.2984; p< .01** |
| **Moffitt & Mohr (2015)** | Reduction in importance scores for both groups, main effect of time F =5.50 **η2p=**.12, p<.05, tend of improvement in consistency for both groups | **n/a** | **No time x group interactions** |
| **Pankey (2008)*** | Improvement for ACT group on values importance d= 0.45 and valued life direction d= 1.01, control group d= 0.22 for importance and d= -0.13 for direction | Improvement for ACT group on values importance d= 0.96 and valued life direction d= 1.23, control group d= -0.21 for importance and d= -0.06 for direction | **Group differences at follow up F (1,20) = 25.340, p = .000, partial eta squared = .559 (ACT> control). Time x group interaction for values importance F (1,20) =14.34, p = .001, partial eta squared = .418. Between group differences for valued direction F (1,20) = 32.206, p = .000, partial eta squared = .617** but no time effect or time x group interaction. |
| **Plumb Vilardaga (2012)*** | Improvement for both groups on all attainment scores, except health for the ACT group. | **n/a** | **Main effect of time** for Relationship Values Attainment (F (1, 22.20) = 5.46, p = .029), and a Leisure Values Attainment (F (1, 17.42) = 3.75, p = .069). |

| Study | Pre-post change | Pre-followup change | Inter group differences |
|---|---|---|---|
| | | | **No time x group interaction** |
| **Steiner (2013)*** | **ACT group improvements in success in family t(17)= 3.19, p <.01, d= 0.75, relationships t(17)= 2.70, p < .05, d= 0.64, work t(17)= 2.75, p<.05, d= 0.64**. Control group improvements in family t(9)= 1.91, p< 0.10, d= 0.60 | **ACT group improvements in success in family t(17)= 3.43, p <.01, d= 0.81, relationships t(17)= 2.27, p < .05, d= 0.53**. Control group improvements in family t(9)= 2.18, p< 0.10, d= 0.69 | **Time x group interaction at post intervention for Intimate relationships F(1, 28) = 5.279, p<.05, Partial $\eta^2$ 0.174**; and for work F(1, 28) = 3.176, p<.10, Partial η2 0.112. |
| **Zargar et al. (2013)** | Improvement for both groups | **n/a** | **No effect of group at post-intervention** |
| **Danitz et al. (in press)** | Decrease in values scores for both groups (**significant for workshop group only, B = -0.30, p =.01, d=-.50;** control group B = -0.16, p = .16, d= -0.29) | **n/a** | **No effect of group at post-intervention** |
| **Emery (2011)*** | n/a (one day workshop so no opportunity for change before the end of the intervention) | Decrease in value scores | **No time x group interaction** F(2,31) = .99, p = .33, **$\eta^2$**p = .03. |
| **Hahs (2013)*** | 5 % change for the ACT group, -1.2% change for the control | **n/a** | **Time x Group interaction** (ACT>control) F(1, 16) = 5.89, p = .028, d=.33 |
| **Maclean (2013)*** | Improvement for ACT group only | **n/a** | **No time x group interaction $\eta p^2$ =** .04 |
| **Michelson et al. (2011)** | **Improvement for the ACT group Wilks' Λ =.65, F(1,28)=14.77, p=.001, $\eta^2$ p=.35).** | **n/a** | **Main effect of group at post treatment (Control>ACT) F(1,56)=4.55, p=.04, $\eta p^2$=.07 and no interaction effect** |
| **Stafford-Brown & Pakenham (2012)** | Improvement for ACT group, decrease for control | Improvement for ACT group | **Time by group interaction (ACT>control), Wilks's Λ = .77,F (1, 54)= 16.31, partial $\eta^2$ = .232, p<.01** |

$\eta^2$ = eta squared, ηp² = partial eta squared, *B* = standardized regression coefficient, *p* = p-value; *d* = effect size

statistical analysis considered inadequate to assess test-retest reliability appropriately, leading to a rating of adequate for measure reliability. No relevant psychometric data was available for the remaining outcome measures. There was some evidence of selective reporting of outcomes. Several studies did not report the scale score as recommended by the measure authors; for the VLQ, Kingston (2008) and Clarke, Taylor, Lancaster, and Remington (2015) used a success-importance discrepancy score in place of the recommended composite score. In addition, Danitz and Orsillo (2014); Danitz, Suvak, and Orsillo (in press); Emery (2011); Levin, Pistorello, Seeley, and Hayes (2014); Levin, Hayes, Pistorello, and Seeley (2016); Moffitt and Mohr (2015); and Steiner, Bogusch, and Bigatti (2013) used a limited set of value domains rather than the full scale for the assessment. The chosen domains were those which may be considered most relevant to the study population; e.g. health for a low physical activity group, and education and relationships for university students. Furthermore, one study (Emery, 2011) specified the value (helping others) as well as the value domain (work) to focus on for the assessment of values-consistent behaviour, which is a deviation from the design of the measure as well as being inconsistent with one of the principles of values work within an ACT framework, i.e. that values should be freely chosen. Assessing for overall risk of bias, only two studies (Hildebrandt, 2014; Kocovski et al., 2013) were rated as having a low risk of bias, five had an unclear risk of bias, and 19 had a high risk of bias.

Effects of interventions

The main findings related to the values-consistent behaviour measures can be seen in Table 3. Results varied across studies, with some showing no effect on values-

consistent behaviour, some demonstrating comparable improvements of values-consistent behaviour for ACT and control groups, and some reporting time by group interactions involving a greater improvement in scores for the ACT group. One study which was considered to have a low risk of bias (Hildebrandt, 2014), found a significant improvement in values-consistent behaviour post-intervention for the supportive instruction control group but not the ACT group, and both groups showed significant improvements at the three month follow up. There was not a significant group effect or time by group interaction. The other study with a low risk of bias (Kocovski et al., 2013) found that both the acceptance-based treatment and CBT were effective in enhancing values-consistent behaviour, whist the no intervention control group showed no change. Studies that reported scores for individual value domains rather than an overall score demonstrated inconsistent results across domains and across time points.

## Discussion

This review aimed to evaluate the effectiveness of ACT-based approaches in enhancing values-consistent behaviour compared with other active treatments and waitlist or no intervention groups.

### Summary of main results

The studies included in this review overall demonstrated a positive effect or no effect on values-consistent behaviour. In some cases, the positive change was significantly greater than the change that occurred with other interventions or in the absence of an intervention, but this was an inconsistent result, with some studies demonstrating

significant changes in values-consistent behaviour for those who had not received an intervention or had received an alternative active treatment.

Quality of the evidence

The overall quality of the studies, with respect to their ability to address the review question, was low (high risk of bias), with outcome measurement being the greatest cause for concern. The degree to which the measures used within these studies are able to accurately assess the target change is unclear at this stage, which could have accounted for the variance in the results. In addition, given the variation in the way these measures were administered, it is likely the integrity of the measures was compromised to a level that the results of some of the studies may not be meaningful.

Another important consideration is the nature of values work, which is inherently complicated to quantify. Whilst values-consistent behaviour is the aim of the intervention, one of the core processes to facilitate this change is values clarification or construction (Wilson, Bordieri, Flynn, Lucas, & Slater, 2011). Available measures may serve a dual function of assessing behaviour in relation to values as well as encouraging reflection on values, especially for individuals who may never have previously considered personal values. Hence, the measurement itself may be an active, therapeutic process for some people, thereby explaining the positive time effects that were found for some no intervention comparison groups. This could also account for why these measures are sometimes used as process measures in studies examining mechanisms of change. Furthermore, given that these measures attempt to assess change across multiple domains, total and subscale scores must be interpreted

with caution. For example, it is possible that for some individuals who demonstrated no change in their values-consistent behaviour score, there could have been meaningful change if they moved from living consistently with one value domain at the expense of others to having more of a balance across domains (Dahl, Plumb, Stewart & Lundgren, 2009). An additional possible explanation of changes on these measures include the belief that one is living consistently with a value domain at baseline but then through the process of the intervention becoming aware that there are other values within the same domain that were being neglected, which may result in a decrease in scores even in the absence of change in behaviour.

There are many other potential ways in which scores on these measures could be misleading within research, yet clinically useful when considering the nuances of change, and the meaning of scores at an individual level. It may therefore be the case that the scores on these measures are most useful in comparing post-intervention and follow-up scores, especially when considering that the short term aims of the intervention are more about removing perceived barriers to change; i.e. creating a state of psychological flexibility. Not all studies in this review had a follow-up period, and out of those that did, the follow-up period usually only applied to the ACT group due to the waitlist group commencing treatment during this time, limiting the usefulness of the follow-up data.

Several of the studies included in this review used participants from non-clinical groups, which reflects the non-pathologising and transdiagnostic approach taken by

ACT, but the appropriateness of such an intervention could be questioned in the absence of an agreement of what constitutes a healthy level of values-consistent behaviour, and a psychometrically sound method of measuring this. Unfortunately, some of the literature uses the term psychological flexibility interchangeably with values-consistent behaviour, and process measures designed to capture some of the ACT processes, e.g. the Acceptance and Action Questionnaire **(**AAQ; Hayes et al., 2004), the Avoidance and Fusion Questionnaire for Youth (AFQ-Y; Greco, Lambert, & Baer, 2008), and the Cognitive Fusion Questionnaire (CFQ; Gillanders, Bolderston, Bond, Dempster, & Flaxman, 2014), have been described as proxy measures of psychological flexibility, all of which create confusion around what the aims and processes of the intervention are, and misleading information about what is being measured. Further work on measures of values-consistent behaviour is required to facilitate appropriate outcome and process measurement. Alongside this, a more encompassing measure of psychological flexibility to assess outcomes may be another avenue for development within ACT research. Ben-Itzhak and Maor (2014) have made some progress in this area with their development of the Psychological Flexibility Questionnaire (PFQ), which has been designed to be more comprehensive than measures currently used within ACT research. The PVQ contains five factors: positive perception of change, characterization of the self as flexible, characterization of the self as open and innovative, perception of reality as dynamic and changing, and a perception of reality as multifaceted. It is currently unclear whether this is being used with research into psychological flexibility, and if these five factors have sufficient overlap with the definition of psychological flexibility used for ACT.

Whilst measurement of both values-consistent behaviour and psychological flexibility is far from ideal, the scrutiny with which we critique available measures must be balanced against a recognition of the novelty of these concepts as outcomes; likewise, these early efforts towards the creation and use of meaningful tools deserve commendation. From a theoretical perspective, further progress in this area may ultimately enable us to reframe the difficulties that we are treating or aiming to prevent as experiential avoidance affecting functioning in one or more domains as a result of psychological inflexibility (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). This could have major implications for suitability of treatment and access to services. Many individuals with diagnoses according to our current systems will likely fit into this category due to experiential avoidance being a transdiagnostic feature of many conditions (Hayes et al., 2004) but appropriate assessment of experiential avoidance may identify those who are more likely to benefit from interventions that target values-consistent behaviour.

Strengths of the review

This review was theoretically driven and, to the authors' knowledge, the first of its kind to assess values-consistent behaviour as the outcome of interest. Traditionally, research trials and systematic reviews have focused on changes to disorder-specific symptoms as a key determinant of the effectiveness of an intervention. However, it is increasingly being recognised that this may be too limited a view of the effects of treatments, and more global indicators of improvement, such as quality of life and wellbeing, are starting to be used within outcome research, particularly for chronic and/or severe conditions (e.g. van Rijn, Carlier, Schuring, & Burdorf, 2016; van Uem

et al., 2016; Pickett, Frampton & Loveman, in press). This more person-centred, values-based approach to examining the impact of psychological treatments is in line with the recovery approach and guidance for treatment delivery from the World Health Organization (WHO, 2013) and Scottish Government (NHS Education for Scotland, 2015).

Inclusion of grey literature is also a strength of the review as a considerable proportion of the included studies were unpublished dissertations and theses. In light of Öst's (2014) finding that effect sizes for ACT RCTs were inflated due to a publication bias for positive results, it is important that the unpublished literature be considered.

Potential biases in the review process

The main limitation of this review was that only English language studies were included, and consequently, there is a chance that there is further evidence available that would have been able to better address the review question. However, given the methodological issues discussed regarding the included studies, especially in relation to the outcome measures, it is unlikely that further evidence would be sufficiently free from those limitations to affect the conclusions.

Implications for practice

At present, given the focus in the literature on assessing the ability of ACT to reduce symptoms of physical illness or psychopathology, practitioners may need to question

whether the way that they are using this intervention is theoretically-driven, as well as how they will monitor effectiveness.

Implications for research

There is a clear need to develop psychometrically robust outcome measures to assess change in values-consistent behaviour, which may involve psychometric testing and/or refinement of existing measures, or the creation of new measures. This would allow an appropriate evaluation of ACT, and may potentially also function to shift the focus in outcome research for psychological interventions in general towards more positive outcomes, as argued for by Seligman and Csikszentmihaly (2000). The current over-emphasis on symptom reduction at the expense of improvement in functioning has been described as outdated, and a recommendation has been made to include effects on functioning within the assessment of whether a treatment can be considered empirically supported (Tolin, McKay, Forman, Klonsky, & Thombs, 2015). This focus on functioning in multiple areas of people's lives can map on well to the value domains included in measures of values-consistent behaviour. During this development phase, continued use of the available measures of values-consistent behaviour as a primary outcome, using the measure authors' scoring and reporting instructions with a sufficient follow-up period, may be a useful first step. Augmenting this with psychometrically-sound quality of life or wellbeing measures may enable researchers to capture change in areas closer to the intervention's aims as a temporary solution whilst more appropriate tools are developed. However, using quality of life or wellbeing measures may reduce the focus on individual values, and might fail to capture the changes that individuals have been working on as part of the

intervention, so the limitations of that approach should be carefully considered. Existing process measures (e.g. AAQ, AFQ, CFQ) should then be used to assess the mechanisms through which change on the above-mentioned outcomes occurs rather than as mechanisms through which change on symptom-focused outcomes occur. Nonetheless, there may still be a role for monitoring symptoms as a secondary outcome to consider the side-effects of the intervention. Whilst there are also issues with the measurement of psychological flexibility, given that improving this construct is considered to be a pre-requisite for engaging in previously avoided behaviours, and is potentially the stage at which treatment might end, a similar review evaluating the effectiveness of ACT in enhancing psychological flexibility may be useful in highlighting the current state of the literature as well as areas for improvement in outcome measurement and study design.

Whilst this review has focused on ACT, shifts in societal perspectives on mental health have identified values-based practice as a fundamental aspect of secondary mental health care, and a critical component of clinical decision making alongside the evidence of effects of treatments on symptoms (Fulford, 2008). Therefore, whilst proponents of ACT may be leading the way in being explicit about values-consistent behaviour being the core aim of the intervention, and may therefore be expected to demonstrate effectiveness with this is mind, research into any interventions aiming to be truly person-centred and values-based could benefit from including a measure of values-consistent behaviour to allow results to have greater clinical applicability.

## Authors' conclusions

There is currently insufficient evidence of an acceptable quality to conclude whether ACT enhances values-consistent behaviour.

## Contributions of authors

All authors contributed to the design of the review, the development of the quality criteria, the interpretation of results, and writing the manuscript. The first author conceptualised the review, conducted searches, identified relevant studies, extracted relevant information from the studies, and rated included studies against the quality criteria.


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## Appendix A. Quality criteria for rating studies

1.1 Sample size (within group comparisons)

| | |
|---|---|
| Good | ≥ 27 participants in the ACT group (for one-tailed t-tests to detect an effect size of 0.5, p< .05, 80% power) |
| Adequate | 12-26 participants in the ACT group (for one-tailed t-tests to detect an effect size of 0.8, p< .05, 80% power |
| Poor / not known / N/A | ≤ 11 participants in the ACT group |
| Notes | Calculated using G*Power 3.1.9.2 |

1.2 Sample size (time-group interactions)

| | |
|---|---|
| Good | Total sample ≥ 24 participants for 3 timepoints or ≥ 26 for 2 timepoints (for an ANOVA to detect an effect size of 0.5, p< .05, 80% power) |
| Adequate | Total sample 12-23 participants for 3 timepoints or 12-25 participants for 2 timepoints (for an ANOVA to detect an effect size of 0.8, p< .05, 80% power) |
| Poor / not known / N/A | ≤ 11 participants in the ACT group |
| Notes | Calculated using G*Power 3.1.9.2 |

1.3 Comparison group

| | |
|---|---|
| Good | Comparison group recruited from the same community as the intervention group with clear and suitable randomisation. |
| Adequate | Comparison group recruited from the same community as the intervention group but not randomised or poor randomisation strategy used. |
| Poor / not known / N/A | Inappropriate or no comparison group |

2.1 Protocol

| | |
|---|---|
| Good | Details of the intervention and comparison condition(s) were clearly defined or referred to if published elsewhere allowing for study replication. This should include intervention length (number and duration of sessions), format (group/1-1/telephone/online/face-to-face). |
| Adequate | Substantial reference made to the content of ACT intervention but insufficient detail regarding the comparison group(s) provided to allow for full study replication. |
| Poor / not known / N/A | Insufficient information provided regarding the details of the intervention to allow for study replication. |

2.2 Fidelity

| | |
|---|---|
| Good | Fidelity to intervention protocol was suitably measured (audio/video tapes rated independently/by a supervisor) and considered high |
| Adequate | Fidelity to treatment was suitably measured and considered acceptable / fidelity considered high but with some weaknesses in measurement (self- or participant-rated) / no measurement of fidelity but supervision was provided by a practitioner experienced in ACT. |

| | |
|---|---|
| Poor / not known / N/A | Poor fidelity to treatment protocol or no reference to fidelity in the paper |

3.1 Reliability of values measure

| | |
|---|---|
| Good | The measure is considered to have good test-retest reliability (≥ 0.7) using a clear and appropriate statistical model (ICC for continuous scores, kappa for nominal scores, weighted kappa (with details of weighting) for ordinal scores). |
| Adequate | The measure is considered to have good test-retest reliability (≥ 0.7) but the choice of statistical model is unclear or inappropriate. |
| Poor / not known / N/A | Test-retest reliability is < 0.7 or is not known |
| Notes | Based on COSMIN checklist Box B. Content validity of the measure required for the study to be eligible for inclusion in the review. |

3.2 Scoring & reporting of values measure

| | |
|---|---|
| Good | Scoring and reporting of scores as recommended by the measure authors |
| Adequate | Scored as recommended by measure authors but one or more primary scores not reported, where relevant |
| Poor / not known / N/A | Unclear how the measures were scored or scoring was different from the recommendation made by authors |

3.3 Follow-up of values measure

| | |
|---|---|
| Good | Long-term (≥6 months) follow-up scores available for values measure |
| Adequate | Short-term (≥3 and <6 months) follow-up scores available for values measure |
| Poor / not known / N/A | Follow up of <3 months duration or no follow-up data for values measure. |
| Notes | Follow up refers to the period from the end of the intervention. |

4.11 Attrition at post-intervention

| | |
|---|---|
| Good | Overall attrition from the study is less than 30% and approximately equal across treatment arms. |
| Adequate | Overall attrition rate of 30-49% or less than 30% but with unequal dropout rates between treatment arms. |
| Poor / not known / N/A | Attrition rates are over 50% or not reported. |
| Notes | Attrition refers to non-completion of the values measure at post-intervention (including a brief delay in a data collection for single session interventions). |

4.12 Attrition at follow-up

| | |
|---|---|
| Good | Overall attrition from the study is less than 30% and approximately equal across treatment arms. |

| | |
|---|---|
| Adequate | Overall attrition rate of 30-49% or less than 30% but with unequal dropout rates between treatment arms. |
| Poor / not known / N/A | Attrition rates are over 50% or not reported. |
| Notes | Attrition refers to non-completion of the values measure at longest follow-up period within the study. |

4.2 Missing data

| | |
|---|---|
| Good | No missing data or intention to treat analysis/appropriate alternative (e.g. maximum likelihood, if missing data are likely to be random) used for missing data for the values measure. |
| Adequate | Modified ITT is mentioned with an acceptable explanation for the modification. |
| Poor / not known / N/A | No missing data analyses are reported or there is a lack of clarity regarding the method used. |

4.3 Adjusted analyses

| | |
|---|---|
| Good | Potential confounders, including baseline differences between groups in valued-living scores, clearly specified and controlled for, where applicable. |
| Adequate | Baseline differences between groups in valued-living scores clearly specified and controlled for, where applicable but no other potential confounders (e.g. demographics) considered. |
| Poor / not known / N/A | Potential confounders specified but not controlled for, where applicable, or not considered. |
| Notes | What can be considered a "potential confounder" related to values-consistent behaviour. This may include age, sex, education, socio-economic status but due to the limited research in this area, it is unclear which factors would be most reasonable to control for. |

4.4 Overall risk of bias

| | |
|---|---|
| Low | Low risk of bias (a rating of at least "adequate") for all relevant criteria (i.e. follow up period and attrition at follow up would not be considered relevant for studies with no follow up). |
| Unclear | Unclear risk of bias for one or more criteria. This includes studies where all criteria were rated as at least adequate, except the reliability of the outcome measure (due to the reliability being unknown rather than poor). |
| High | High risk of bias for one or more criteria. |

## Appendix B. Author guidelines for *Behaviour Research & Therapy*

***Article structure***

*Subdivision - unnumbered sections*

Divide your article into clearly defined sections. Each subsection is given a brief heading. Each heading should appear on its own separate line. Subsections should be used as much as possible when crossreferencing text: refer to the subsection by heading as opposed to simply 'the text'.

*Appendices*

If there is more than one appendix, they should be identified as A, B, etc. Formulae and equations in appendices should be given separate numbering: Eq. (A.1), Eq. (A.2), etc.; in a subsequent appendix,
Eq. (B.1) and so on. Similarly for tables and figures: Table A.1; Fig. A.1, etc.

***Essential title page information***

• ***Title.*** Concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae where possible.
• ***Author names and affiliations.*** Please clearly indicate the given name(s) and family name(s) of each author and check that all names are accurately spelled. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lowercase superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
• ***Corresponding author.*** Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. **Ensure that the e-mail address is given and that contact details are kept up to date by the corresponding author.**
• ***Present/permanent address.*** If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.

*Abstract*

A concise and factual abstract is required with a maximum length of 200 words. The abstract should state briefly the purpose of the research, the principal results and major conclusions. An abstract is often presented separately from the article, so it must be able to stand alone. For this reason, References should be avoided, but if essential, then cite the author(s) and year(s). Also, non-standard or uncommon abbreviations should be avoided, but if essential they must be defined at their first mention in the abstract itself.

***Graphical abstract***

Although a graphical abstract is optional, its use is encouraged as it draws more attention to the online article. The graphical abstract should summarize the contents of the article in a concise, pictorial form designed to capture the attention of a wide readership. Graphical abstracts should be submitted as a separate file in the online submission system. Image size: Please provide an image with a minimum of 531 × 1328 pixels (h × w) or proportionally more. The image should be readable at a size of 5 × 13 cm using a regular screen resolution of 96 dpi. Preferred file types: TIFF, EPS, PDF or MS Office files. See https://www.elsevier.com/graphicalabstracts for examples. Authors can make use of Elsevier's Illustration and Enhancement service to ensure the best presentation of their images and in accordance with all technical requirements: Illustration Service.

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Highlights are mandatory for this journal. They consist of a short collection of bullet points that convey the core findings of the article and should be submitted in a separate editable file in the online submission system. Please use 'Highlights' in the file name and include 3 to 5 bullet points (maximum

85 characters, including spaces, per bullet point). See https://www.elsevier.com/highlights for examples.

*Keywords*

Immediately after the abstract, provide a maximum of 6 keywords, to be chosen from the APA list of index descriptors. These keywords will be used for indexing purposes.

***Abbreviations***

Define abbreviations that are not standard in this field in a footnote to be placed on the first page of the article. Such abbreviations that are unavoidable in the abstract must be defined at their first mention there, as well as in the footnote. Ensure consistency of abbreviations throughout the article.

***Acknowledgements***

Collate acknowledgements in a separate section at the end of the article before the references and do not, therefore, include them on the title page, as a footnote to the title or otherwise. List here those individuals who provided help during the research (e.g., providing language help, writing assistance or proof reading the article, etc.).

*Formatting of funding sources*

List funding sources in this standard way to facilitate compliance to funder's requirements: Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa]. It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding. If no funding has been provided for the research, please include the following sentence: This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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This option is designed to allow publication of research reports that are not suitable for publication as regular articles. Shorter Communications are appropriate for articles with a specialized focus or of particular didactic value. Manuscripts should be between 3000-5000 words, and must not exceed the upper word limit. This limit includes the abstract, text, and references, but not the title page, tables and figures.

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Please submit tables as editable text and not as images. Tables can be placed either next to the relevant text in the article, or on separate page(s) at the end. Number tables consecutively in accordance with their appearance in the text and place any table notes below the table body. Be sparing in the use of tables and ensure that the data presented in them do not duplicate results described elsewhere in the article. Please avoid using vertical rules.

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Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

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*Examples:*

Reference to a journal publication:

Van der Geer, J., Hanraads, J. A. J., & Lupton, R. A. (2010). The art of writing a scientific article.
*Journal of Scientific Communications, 163*, 51–59.

Reference to a book:
Strunk, W., Jr., & White, E. B. (2000). *The elements of style.* (4th ed.). New York: Longman, (Chapter 4).
Reference to a chapter in an edited book:
Mettam, G. R., & Adams, L. B. (2009). How to prepare an electronic version of your article. In B. S. Jones, & R. Z. Smith (Eds.), *Introduction to the electronic age* (pp. 281–304). New York: E-Publishing Inc.
Reference to a website:
Cancer Research UK. Cancer statistics reports for the UK. (2003). http://www.cancerresearchuk.org/aboutcancer/statistics/cancerstatsreport/ Accessed 13.03.03.

**Values, values-consistent behaviour and wellbeing in adolescents.**

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## Abstract

**Purpose:** This study aimed (i) to assess the psychometric properties of measures of values and values-consistent behaviour when used with an adolescent population; (ii) to assess which values are endorsed by adolescents; and (iii) to explore whether values-consistent behaviour accounts for some of the variation in wellbeing scores beyond known correlates (mindfulness and avoidance). **Methods:** This was a cross-sectional questionnaire study involving a community sample of 94 adolescents (13-17 years old), including a test-retest component for the values measures. The measures included the Warwick-Edinburgh Mental Well-being Scale, Valued Living Questionnaire 2 (VLQ-2), Portrait Values Questionnaire – Second Revision, Avoidance and Fusion Question for Youth – Short Form, and the Child and Adolescent Mindfulness Measure. **Results:** The valued living composite of the VLQ-2 had fair to good test-retest reliability and there were concerns about the validity of some of the items with this population. A significant positive relationship (Pearson's $r$ = .471, bootstrapped confidence interval .201-.677) was found between values-consistent behaviour and wellbeing. Values-consistent behaviour accounted for an additional 13% of variance in wellbeing scores above avoidance, mindfulness and demographics. **Conclusions:** This study provided some evidence in line with theoretical models suggesting a positive relationship between values-consistent behaviour and wellbeing. Further development work is required to make the VLQ-2 a more suitable measure for adolescents.

## Keywords

Wellbeing, values, adolescents, acceptance and commitment therapy

## Introduction

Across health and mental health settings, there is increasing recognition of the importance of working with patients' personal values in service of their overall wellbeing and quality of life. This is reflected in the emphasis on recovery and wellbeing focused approaches in a number of multi-professional position statements and national strategy documents [1 - 4]. Personal values work features as a core component in a range of psychological treatments, such as motivational interviewing, behavioural activation and systemic therapy, whilst other interventions, such as acceptance and commitment therapy (ACT), go further in prioritising the enhancement of values-consistent behaviour above other more traditional outcomes. Conceptually, this enables more personally-defined wellbeing and quality of life parameters; however, empirical investigations into the interconnectedness between these constructs are needed to aid our understanding of the importance of values-consistent behaviour as an outcome.

Values-based psychological approaches are now being used with adolescents as well as adults, and the gaps in the literature are even more pronounced for this population. There is some evidence to suggest that psychological flexibility, which is sometimes used interchangeably in the ACT literature with values-consistent behaviour, is positively associated with life satisfaction [5] and various indicators of quality of life [6] in adults. Research investigating the relationship between values-consistent behaviour and quality of life is more limited but preliminary data on a community sample of adults appear promising [7], warranting further support with different populations (e.g. normative samples of adolescents). Similarly, a meta-analysis of the

effect of behavioural activation on wellbeing [8] found a moderate effect size; however, only one of the included studies included children [9], and found no effect. One study [10] exploring the relationship between engaged living (behaviours focused on helping others and immersion in activities) and wellbeing in adolescents found a positive relationship but it is unclear if the behaviours of interest were linked with the adolescents' values. In addition, development studies for ACT-relevant process measures found a negative association between experiential avoidance and quality of life [11], and a positive association between mindfulness and quality of life [12] in children and adolescents. Therefore, in addition to the strength of relationship between values-consistent behaviour and wellbeing or quality of life for adolescents being unknown, it is also unclear whether values-consistent behaviour adds anything to the wellbeing picture that cannot be accounted for by levels of experiential avoidance and mindfulness.

One explanation of why the relationship between these constructs has not been adequately explored is the availability of psychometrically robust tools (see Chapter 1 of this thesis). Whilst there have been some attempts to measure values-consistent behaviour for use in clinical settings and within ACT research [13-19], the limited data on the psychometric properties of these measures come from adult samples, and it is therefore unclear how suitable they are for use with adolescents. The developmental stage of adolescence might affect stability of values and value priorities, particularly as these will still be forming. Consequently, some of the value domains (e.g. parenting and employment) in the aforementioned measures may seem irrelevant to many adolescents. At present, researchers are faced with the choice of

using existing measures which may not be developmentally appropriate, to create and test a new measure, or to not measure change in the core target (values-consistent behaviour) of the intervention at all, and this is precluding the development of a strong evidence base for ACT [20].

The Valued Living Questionnaire 2 (VLQ-2 [14]) has tried to account for some of the issues regarding stage of life by asking respondents to rate if it is possible that something important could happen within each value domain, if it is important to them overall in their life, and if they are satisfied with how consistently they are living with these values. Despite the aforementioned considerations, the necessity to be aware of personal values to complete this measure may be problematic for adolescents. Twohig et al. [21] suggested that larger values would be difficult for children and adolescents to specify, and that determining their values could come about as therapy progressed. Furthermore, Wicksell and Greco [22] proposed that it was part of the therapist's role to clarify values using the concrete goals which this client group will respond with when asked for their values. However, the VLQ-2 may be a useful starting point from which to make developmentally appropriate adaptations.

An indirect and concrete values measure which has been used for research in normative samples of adolescents, is the Portrait Values Questionnaire (PVQ [23]), based on Schwartz's theory of basic human values [24]. This tool could provide information about adolescent values to assist the development or adaptation of values-consistent behaviour measures. There are several versions of the PVQ of

varying length; the one recommended for use by the author during the planning of this study was the PVQ-RR (S. Schwartz, personal communication), which is based on a refinement of the original theory [25]. However, there is currently no published literature outlining the psychometric properties or exploring if the PVQ-RR is a meaningful tool for assessing values in adolescents.

This study aimed to address the following questions:

*Primary questions*

- Is the VLQ-2 a reliable and valid measure of values-consistent behaviour for adolescents?
- Is the PVQ-RR a valid and reliable measure of values in adolescents?
- What values are important to adolescents?

*Secondary questions*

- Is values-consistent behaviour associated with wellbeing in adolescents?
- If the above relationship exists, to what extent does values-consistent behaviour account for the proportion of variance in wellbeing in adolescents, relative to experiential avoidance and mindfulness?

## Methods

### Design

This study used a cross-sectional survey design with a repeated measures component to assess test-retest reliability.

## Participants

### *Eligibility*

Adolescents aged 13-17 year old with the ability to read and complete the questionnaires were eligible for this study.

### *Recruitment*

Participants were recruited from two secondary schools in southeast Scotland. One was a state school and the other an independent fee-paying school. A total of 133 information packs were sent and six opt-outs received. Stage one of the study included 94 participants (mean age 14.6, SD 1.3; 37.2% female, 61.7 male, 1.1% indicated that they preferred not to state their gender) Scottish Index of Multiple Deprivation (SIMD 2012) ranks ranged from 409 to 6473 with a median of 4676 (N=66, nine postcodes were either incomplete or not recognised by the SIMD database, and 19 were not reported). For Stage two of the study, data were available for 55 participants.

## Ethics

Ethics approval for this study was obtained from the University of Edinburgh's School of Health in Social Science ethics committee (see Appendix A). Passive consent was sought from parents by sending an information sheet (Appendix B) and opt-out form (Appendix C) in the post.

Materials

Participants were given the following questionnaires to complete, and were asked to write the last five digits of their phone number (either a mobile or landline number) as a unique code for matching data from the two time points so that it was memorable, whilst having a low risk of being identifiable:

*Demographic variables form*

This was a brief data form to collect demographic information (gender, age, first half of postcode to rate against the Scottish Index of Multiple Deprivation (SIMD) 2012 dataset). The SIMD ranks postcodes from 1 (most deprived) to 6505 (least deprived).

*Warwick-Edinburgh Mental Well-being Scale (WEMWBS, [26])*

The WEMWBS was used to assess wellbeing. It is a 14-item scale, and has been validated for use with adolescents aged 13 years and older [27]. The items are designed to cover hedonic and eudaimonic wellbeing perspectives. Clarke et al. [27] found high internal consistency (Cronbach's alpha 0.87; 95% CI [0.85- 0.88]). Due to the potential effect of the values-consistent behaviour measure on emotional state, the WEMWBS was placed at the beginning of the questionnaire pack.

*Valued Living Questionnaire 2 (VLQ-2; [14])*

The VLQ-2 was used to assess values-consistent behaviour. It contains 12 value domains: *family, marriage/couples/intimate relation, parenting, friends/social life, work, education/training, recreation/fun, spirituality, community life, physical self-care, the environment,* and *aesthetics*. It asks for a rating from 1 to 10 on the

*possibility* of something important happening in each domain, its *current importance, overall importance, action* in that area over the past week, *satisfaction with action*, and *concern* that the area will not progress as desired. In the absence of a recommended scoring system for this measure, the scoring system for the original VLQ [13] was used for this study (the composite score based on the *current importance* and *action* ratings). An additional question was added to ask "Are there any other areas of your life which are important to you that this questionnaire has not asked about? If yes, please write them down." This was to assess if the VLQ-2 is missing any important value domains relevant to adolescents.

*Portrait Values Questionnaire – Second Revision (PVQ-RR; Schwartz, unpublished)*

The PVQ-RR was used to assess overall values. It is considered suitable for adolescent populations aged 11 years and over [23]. Each of the 57 items describes something which is important to a person as an implicit indication of their values. The respondent is asked to rate "How much like you is this person?" on a 6-point scale ranging from *Not like me at all* to *Very much like me*. There is a male and a female version which differ only in their gender pronouns. As detailed for the VLQ-2, an additional question was included at the end of this questionnaire to capture any other values which are not addressed.

*Avoidance and Fusion Questionnaire for Youth (AFQ-Y8 [11])*

The AFQ-Y8 was used to assess experiential avoidance. It contains eight items, and is considered suitable for children over 9 years old (internal consistency $\alpha = .83$ [11]). Negative associations were found with quality of life, as measured by the

Youth Quality of Life-Revised scale (YQOL-R; -.29 and -.43 in different samples [11]).

*Child and Adolescent Mindfulness Measure (CAMM [12])*

The CAMM was used to assess mindfulness. It is a 10-item measure designed for young people over 9 years old, and has good internal consistency $\alpha = .81$ [12]. Positive associations were found with the YQOL-R (.25 [12]).

## Procedure

Stage 1: The main study was conducted during class time in October - November 2015. Questionnaires were administered by the first author or class teacher, according to the schools' preferences/logistics of the study being conducted in several classes simultaneously.

Stage 2: Participants were asked to complete the VLQ-2 and PVQ-RR a second time. This set of questionnaires was administered four weeks after stage 1 for the first class, and three weeks after stage 1 for the remaining classes.

## Missing data

Details of how invalid responses were coded can be found in Appendix D. The unique identifiers on 21 stage 2 datasets did not match any from stage 1 and therefore those data could not be used. In addition, one set of questionnaires was considered void and consequently not entered into the dataset. The spread of missing data across questionnaires can be seen in Appendix E. The expectation maximization (EM)

method was used to impute missing data for each questionnaire (except the first set of VLQ-2 and PVQ-RR results, which did not converge with 1000 iterations), including age, gender and SIMD as predictor variables. Maximum iterations were set at 100 (1000 for PVQ-RR retest data due to a failure to converge at 100). Linear interpolation was used to impute missing data for the first set of VLQ-2 and PVQ-RR results. For each participant, any questionnaires that had over 50% of missing data were recoded as missing to exclude those data from further analyses.

Planned analyses

Data were analysed using SPSS 22 for Windows. Intra-class correlations (ICCs) were performed on the VLQ-2 and PVQ-RR scores to assess test-retest reliability. ICCs of < 0.4 were considered poor, 0.4-0.75 considered fair to good, and >0.75 considered excellent reliability [28]. Qualitative information from questionnaire administration, and further exploration of missing data were also used to assess validity. A bivariate correlation using Pearson's *r* was performed on the VLQ-2 and WEMWBS scores. Hierarchical multiple regression was used to assess the proportion of variance on the WEMWBS that is accounted for by the VLQ-2 compared with demographic variables (entered as first block), and the CAMM and AFQ-Y8 (second block).

There was little comparable literature to draw upon during the planning of this study to estimate likely effect sizes; consequently, a priori sample size calculations were based on medium effect sizes. Using G*Power 3 [29], 67 was the sample size required to detect a medium effect size for the above analyses. A medium effect size

was defined in this programme as 0.3 for the correlation, and 0.15 for the regression analyses. Due to recruitment difficulties, the study had insufficient power to conduct a planned confirmatory factor analysis on the PVQ-RR, for which it is recommended to have a minimum of 200 participants [30]. Where relevant, bootstrapped 95% confidence intervals (CIs) were used, based on 1000 samples, and results considered statistically significant where these did not cross zero.

## Results

Descriptive statistics

A summary of results for stage 1 data can be seen in Table 1, including the mean scores for the 19 values within the PVQ-RR. A more detailed summary of descriptive statistics for the VLQ-2 scores can be seen in Table 2. Highest mean ratings were given for the following values on the PVQ-RR: *benevolence-care, hedonism, achievement, benevolence-dependability, self-direction action* and *self-direction thought*. The order of *current importance* for value domains on the VLQ-2 from highest to lowest was: *education, friends, physical self-care, family, recreation, aesthetics, work, environment, community life, marriage/relationships, spirituality,* and *parenting. Concern* ratings were highest for *education, physical self-care* and *friends.*

Responses from the open ended questions included some values/value domains that were assessed by the questionnaires (family, friendships, sleep, independence, education, humility). Participants also indicated that they cared about their mental health, confidence, feelings, sports, money, life in general, the world, caring for

people in general (including migrants) and caring for animals, pets, maintaining a positive attitude, travel, what other people think of them, rebelling, and being grateful for what you have.

Table 1. Descriptive statistics for measures completed for stage 1.

| | N | Minimum | Maximum | Mean (SD) |
|---|---|---|---|---|
| VLQ-2 | 90 | 10.00 | 83.50 | 41.08 (13.73) |
| PVQ-RR mean | 93 | 2.75 | 5.37 | 4.12 (.58) |
| Self-direction Thought | 93 | 2.00 | 6.00 | 4.47 (.92) |
| Self-direction Action | 93 | 1.67 | 6.00 | 4.56 (.83) |
| Stimulation | 93 | 2.00 | 6.00 | 4.28 (.93) |
| Hedonism | 93 | 1.00 | 6.00 | 4.89 (.95) |
| Achievement | 93 | 2.33 | 6.00 | 4.72 (.88) |
| Power-Dominance | 93 | 1.00 | 6.00 | 2.73 (1.17) |
| Power-Resources | 93 | 1.00 | 6.00 | 3.39 (1.29) |
| Face | 93 | 2.33 | 6.00 | 4.22 (1.00) |
| Security Personal | 93 | 2.00 | 6.00 | 4.40 (.99) |
| Security Societal | 93 | 1.00 | 6.00 | 4.11 (1.15) |
| Tradition | 93 | 1.00 | 6.00 | 3.12 (1.23) |
| Conformity-Rules | 93 | 1.00 | 6.00 | 3.83 (1.30) |
| Conformity-Interpersonal | 93 | 1.00 | 6.00 | 3.95 (1.16) |
| Humility | 93 | 1.83 | 6.00 | 4.02 (.98) |
| Universalism-Nature | 93 | 1.00 | 6.00 | 3.17 (1.26) |
| Universalism-Concern | 93 | 1.00 | 6.00 | 4.39 (1.07) |
| Universalism-Tolerance | 93 | 1.67 | 6.00 | 4.41 (.96) |
| Benevolence –Care | 93 | 2.33 | 6.00 | 5.04 (.92) |
| Benevolence-Dependability | 93 | 1.33 | 6.00 | 4.69 (.98) |
| WEMWBS | 85 | 23.53 | 65.00 | 48.68 (8.79) |
| AFQ-Y8 | 88 | .00 | 3.75 | 1.42 (.91) |
| CAMM | 88 | .00 | 4.00 | 1.70 (.93) |

WEMWBS = Warwick-Edinburgh Mental Well-being Scale, VLQ-2 = Valued Living Questionnaire 2, PVQ-RR = Portrait Values Questionnaire Second Revision, AFQ-Y8 = Avoidance & Fusion Questionnaire for Youth Short Form, CAMM = Child & Adolescent Mindfulness Measure.

Additional comments that were written about the questionnaires:

- *For the VLQ-2:* "if it means my parents and not becoming a parent myself", possibility "I really don't know what this is supposed to mean", and "n/a" for the *work* and *spirituality* domains.

- *For the PVQ-RR:* "define (rich or happy)" was written by one of the items, and "to him" was crossed out on one of the male PVQ-RR questionnaires.

Reliability and validity of the VLQ-2

The ICC (two-way random, consistency model) for the values-consistent behaviour composite score across the two time points was 0.63 (N=51, 95% CI 0.44 - 0.77).

Questions that were asked by the participants whilst completing the VLQ-2 were in relation to the following issues, each of which was asked by one to three participants:

- *Possibility*: whether this section was asking about possibility at their current stage of life or possibility at any point in their lifetime;
- *Overall importance*: what this meant;
- *Parenting*: whether this was asking about their parents or being a parent;
- The meaning of the words *recreation* and *spirituality*.

Little's MCAR test suggested that the missing data for the original VLQ-2 dataset were missing completely at random (Chi-Square = 1182.126, df = 1177, Sig. = .453). To explore whether this statistic had missed any potential patterns which might suggest issues with the validity of those items, the frequency of missing data for each item was examined (see Appendix F). S*pirituality, community life, work, aesthetics* and *recreation* were the value domains with the highest rates of missing data.

Table 2. Item-level means and standard deviations for the Valued Living Questionnaire 2 at stage 1.

| ***N=90*** | **Possibility** | **Current Importance** | **Overall Importance** | **Action** | **Satisfaction with Action** | **Concern** |
|---|---|---|---|---|---|---|
| Family | 7.09 (2.43) | 7.76 (2.46) | 8.61 (1.97) | 6.22 (2.67) | 6.84 (2.52) | 4.53 (3.10) |
| Marriage/relationships | 7.12 (2.74) | 4.50 (2.94) | 6.89 (2.70) | 3.56 (2.84) | 6.44 (3.21) | 4.47 (2.81) |
| Parenting | 6.65 (3.02) | 3.82 (3.39) | 7.21 (3.03) | 3.01 (2.96) | 6.21 (3.69) | 4.23 (3.19) |
| Friends | 8.30 (2.00) | 8.39 (1.98) | 8.35 (2.11) | 7.63 (2.43) | 7.90 (2.45) | 5.01 (3.24) |
| Work | 7.48 (2.83) | 6.01 (3.14) | 8.36 (2.20) | 4.83 (3.20) | 6.00 (3.00) | 4.69 (3.20) |
| Education | 8.36 (1.64) | 8.71 (1.74) | 8.82 (1.69) | 7.79 (1.99) | 7.61 (2.25) | 6.12 (3.02) |
| Recreation | 7.92 (2.08) | 7.48 (2.45) | 7.86 (2.11) | 6.87 (2.59) | 7.13 (2.87) | 4.27 (3.18) |
| Spirituality | 4.56 (3.19) | 4.05 (3.09) | 4.45 (3.23) | 3.64 (2.96) | 5.76 (3.47) | 2.84 (2.49) |
| Community Life | 5.46 (2.85) | 4.65 (2.84) | 5.26 (2.80) | 4.06 (2.69) | 5.70 (3.18) | 3.43 (2.58) |
| Physical self-care | 7.74 (2.53) | 7.92 (2.36) | 8.41 (2.03) | 7.02 (2.61) | 6.66 (2.76) | 5.67 (3.08) |
| Environment | 5.04 (3.03) | 5.17 (3.03) | 6.07 (3.04) | 3.79 (2.95) | 5.38 (3.22) | 4.45 (3.00) |
| Aesthetics | 6.10 (3.19) | 6.31 (3.08) | 6.44 (3.03) | 5.68 (3.01) | 6.99 (2.85) | 3.78 (2.94) |

Table 3. Test-retest reliability of values on the Portrait Values Questionnaire – Second Revision using centred scores.

| Values | ICC (95% CI) N=54 |
|---|---|
| Self-direction Thought | 0.61 (0.41-0.75) |
| Self-direction Action | 0.46 (0.22-0.65) |
| Stimulation | 0.69 (0.52-0.81) |
| Hedonism | 0.70 (0.53-0.81) |
| Achievement | 0.67 (0.50-0.80) |
| Power-Dominance | 0.69 (0.52-0.81) |
| Power-Resources | 0.87 (0.79-0.93) |
| Face | 0.62 (0.42-0.76) |
| Security Personal | 0.64 (0.45-0.78) |
| Security Societal | 0.59 (0.38-0.74) |
| Tradition | 0.61 (0.41-0.75) |
| Conformity-Rules | 0.82 (0.70-0.89) |
| Conformity-Interpersonal | 0.70 (0.53-0.81) |
| Humility | 0.35 (0.09-0.56) |
| Universalism-Nature | 0.83 (0.72-0.90) |
| Universalism-Concern | 0.47 (0.23-0.65) |
| Universalism-Tolerance | 0.59 (0.38-0.74) |
| Benevolence –Care | 0.77 (0.63-0.86) |
| Benevolence-Dependability | 0.35 (0.09-0.56) |
| Overall mean | 0.77 (0.63-0.86) |

Reliability and validity of the PVQ-RR

To account for scale use biases, Schwartz (personal communication) recommended various data corrections for different analyses. In line with this, the ICC (two-way random, consistency model) to assess test-retest reliability was conducted using centred scores (the value mean – the overall mean). The test-retest reliability of individual values range from poor to excellent.

During the completion of the PVQ-RR, one participant said they did not agree with there being a male and female version of the questionnaire, and would have preferred the same form for everyone. Another participant did not understand the words *state*

and *citizens* in one of the items. The final query about the PVQ-RR was regarding the meaning of the item: *It is important to her never to think she deserves more than other people.*

Relationship between values-consistent behaviour and wellbeing

There was a significant positive correlation between the values-consistent behaviour scores on the VLQ-2 and the WEMWBS scores (N = 82, Pearson's *r* = .465, bootstrapped confidence interval .208 - .667).

Table 4. Multiple regression model for wellbeing.

| Model | | B | Bootstrap | | | | |
|---|---|---|---|---|---|---|---|
| | | | Bias | Std. Error | Sig. (2-tailed) | 95% Confidence Interval | |
| | | | | | | Lower | Upper |
| 1 | (Constant) | 73.79 | 1.06 | 14.11 | < .01 | 47.36 | 103.02 |
| | gender | -4.59 | < .01 | 1.63 | < .01 | -8.08 | -1.53 |
| | age | -1.19 | -.07 | 1.00 | .26 | -3.22 | .63 |
| | SIMD | .000 | < -.01 | < .01 | .83 | < -.01 | < .01 |
| 2 | (Constant) | 66.51 | 1.08 | 12.07 | < .01 | 44.32 | 93.40 |
| | gender | -1.10 | .15 | 1.50 | .45 | -3.65 | 2.50 |
| | age | -.65 | -.08 | .86 | .44 | -2.60 | .98 |
| | SIMD | < .01 | < -.01 | < .01 | .40 | < -.01 | < .01 |
| | AFQ-Y8 | -2.40 | .09 | 1.99 | .23 | -5.95 | 2.00 |
| | CAMM | -2.68 | -.06 | 1.80 | .15 | -6.38 | .81 |
| 3 | (Constant) | 48.47 | .46 | 12.46 | < .01 | 25.52 | 73.85 |
| | gender | -1.14 | .02 | 1.23 | .31 | -3.90 | 1.26 |
| | age | -.14 | -.04 | .81 | .86 | -1.84 | 1.37 |
| | SIMD | <.01 | < -.01 | < .01 | .27 | < .01 | < .01 |
| | AFQ-Y8 | -1.59 | .12 | 1.77 | .36 | -4.85 | 2.32 |
| | CAMM | -3.46 | -.07 | 1.62 | .04 | -6.68 | -.20 |
| | VLQ-2 | .25 | .01 | .07 | < .01 | .13 | .39 |

AFQ-Y8 = avoidance and fusion questionnaire for youth – short form; CAMM = child and adolescent mindfulness measure; VLQ-2 = valued living questionnaire 2

Relative contribution of values-consistent behaviour to wellbeing

Within the hierarchical multiple regression model, all steps of the model were significantly related to wellbeing, with values-consistent behaviour accounting for an additional 13 % in the variance in wellbeing scores: demographics (step 1) $R^2 = .178$, adjusted $R^2 = .129$, B=73.79 [CI 47.36-103.02]; avoidance and mindfulness (step 2)

$R^2$= .424, adjusted $R^2$ = .364, B=66.51 [CI 44.32-93.40]; values-consistent behaviour (step 3) $R^2$ = .551, adjusted $R^2$ = .494, B=48.47 [CI 25.52-73.85]. Further results of the model can be seen in Table 4.

## Discussion

The purpose of this study was to (i) assess the psychometric properties of measures of values (the PVQ-RR) and values-consistent behaviour (the VLQ-2) when used with an adolescent population; (ii) to assess which values are endorsed by adolescents; and (iii) to explore whether values-consistent behaviour accounts for some of the variation in wellbeing scores beyond known correlates (mindfulness and avoidance).

### Summary of results

*VLQ-2*

The *current importance* and *success* elements of the VLQ-2 used to obtain a values-consistent behaviour score had a test-retest reliability generally considered fair to good (ICC = 0.63). It is possible that removing some items would improve the test-retest reliability. The current level could either reflect issues of measurement or the nature of adolescence where potential clashes between parental and peer group values may lead to oscillations in what is considered important. The domains rated most highly for *current importance* were: *education, friends, physical self-care, family,* and *recreation.* The sections asking about *possibility* and *parenting* caused confusion for a small number of participants, and the meaning of the words *recreation* and *spirituality* was queried. *Spirituality, community life, work* and

*aesthetics* were the domains with the highest levels of missing data. It is therefore unclear how accurate scores for some sections are, and whether the domains themselves, the terms used or the instructions are not suitable for this population.

*PVQ-RR*

The highest rated values were *benevolence-care, hedonism, achievement, benevolence-dependability, self-direction action* and *self-direction thought*. Whilst the overall ICC for PVQ-RR mean demonstrated excellent test-retest reliability, some of the individual values had poor reliability.

*Wellbeing*

Values-consistent behaviour accounted for an additional 13% of variance in wellbeing scores above avoidance, mindfulness and demographics. Given the concerns regarding the interpretation of items on the VLQ-2, it is possible this is an inaccurate estimation. Nonetheless, the results suggest that there is a relationship between values-consistent behaviour and wellbeing.

Strengths and limitations of the study

This study was one of the first to consider values-consistent behaviour in a normative sample of adolescents. The use of two values measures and open-ended questions allowed for the possibility of assessing values from different theoretical perspectives, as well as collecting potentially important idiosyncratic information from participants.

Whilst some participants asked questions during the assessment, detailed qualitative information was not collected, and therefore it is unclear how the full range of items for the values measures were interpreted. One participant indicated that they did not feel the work and spirituality domains on the VLQ-2 were applicable, and other participants may have left some items unanswered for the same reason. The questions asked during completion of the questionnaires suggest that a difficulty in understanding the items may be an additional explanation of the missing data; however, the full reasons for the missing data are unknown. This could be an area for future exploration, particularly if the measures are to be adapted for this population.

The majority of the data from this study came from adolescents attending an independent fee-paying school, and the SIMD data suggest that many of the participants were from the least deprived areas of Scotland, which might limit the generalisability of the results. There is some evidence to suggest that adolescent values are influenced by type of school [31] and socioeconomic circumstances [32, 33], and therefore data from a more diverse sample of adolescents may lead to a different set of results.

Implications

Whilst causality cannot be inferred from the current results, it is possible that interventions which seek to enhance values-consistent behaviour may contribute to a greater sense of wellbeing for adolescents. Consequently, professionals working with adolescents in various settings such as schools, health and mental health services, might be more successful in facilitating behaviour change aimed at enhancing

wellbeing when the behaviours are linked to each adolescent's values, particularly those related to education, friends, physical self-care, family, recreation/hedonism, benevolence and self-direction. However, it is also possible that a greater sense of wellbeing facilitates values-consistent behaviour [34]. Irrespective of direction of effect, impairment in those areas of life may also indicate that an adolescent is in need of support.

As the confidence interval for the stability over time of scores relating to values-consistent behaviour was only just within the fair to good range, the VLQ-2 may need some adaptions to be suitable for use with adolescents as an outcome measure in intervention studies. As there were fewer queries and a low rate of missing data for the PVQ-RR, as well as it being a measure based on previous versions thought to be suitable for adolescents, it is unclear why the test-retest reliability was not higher for some values. It could be that, even within the space of a few weeks, the participants were questioning what was important to them, and had considered different things to be important at stage two of the assessment. This could be a result of completing the questionnaires, which may itself have had a values clarification or construction effect (one of the core processes of ACT [35]). The high ratings given to most items on this scale suggests that it may be useful as part of values construction work with adolescents rather than as a measurement tool.

Recommendations for future research

Future research could focus on adapting the VLQ-2 for adolescents, potentially by removing some domains (e.g. parenting) that are not immediately relevant to this

population, rephrasing the instructions so there is less ambiguity, and allowing space for additional values that are not covered by the main questions. The Values Compass [36], primarily designed for clinical work, includes *caregiving* as a valued domain, which may be a useful way of accounting for benevolence values, including caring for pets/animals. Given that adolescents may focus on the way they are treated by others rather than on their own behaviour when beginning values work [37], example values provided for each domain, potentially using similar phrasing to the PVQ-RR, could be a helpful addition to measurement tools. Qualitative studies, e.g. using cognitive interviewing, could add to our understanding of how the items are interpreted and rated. Based on the frequency (over 40%) with which a rating of zero was given on the VLQ-2, a 0-10 rating scale might be more helpful than the current 1-10 scale. Until development work has progressed in this area, using the existing *current importance* and *success* items of the VLQ-2 might be a useful way of assessing meaningful change in psychotherapeutic work, particularly, but not limited to, ACT. However, any effects demonstrated in research trials should be treated with caution.

## Conclusions

This study provides some evidence in line with theoretical models suggesting a positive relationship between values-consistent behaviour and wellbeing. Further development work, particularly by making the instructions clearer, is required to make the VLQ-2 a more suitable measure for adolescents but it may be an acceptable measure to use in the interim.

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## Appendix A – Ethical approval documents

School of Health in Social Science
Clinical Psychology

The University of Edinburgh
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Telephone 0131 651 3969
Fax 0131 650 3891
Email submitting.ethics@ed.ac.uk

Davina Chauhan
Trainee Clinical Psychologist
University of Edinburgh

16 December 2014

Dear Davina,

**Application for Level 2 Approval**

Re: Values, values-consistent behaviour and wellbeing in adolescents

Thank you for submitting the above research project for review by the Section of Clinical Psychology Ethics Research Panel. I can confirm that the submission has been independently reviewed and was approved on the 14th December 2014.

Should there be any change to the research protocol it is important that you alert us to this as this may necessitate further review.

Yours sincerely,

Kirsty Gardner

Administrator
Clinical Psychology

# Re: Thesis level 2-3 ethics amendment Davina Chauhan

C CLINICAL PSYCHOLOGY Research Ethics

To: ☐ CHAUHAN Davina;

Reply

21/09/2015

Inbox

Dear Davina,

Thank you for submitting your amendment. I'm happy to say that this is a straightforward amendment and on this basis I'm satisfied that the project continues to meet University Ethics requirements. I have not signed off your form as you submitted by scanned pdf, but please use this email as confirmation of the amendment.

Best wishes,

Angus

Angus MacBeth
Lecturer in Clinical Psychology
Ethics Tutor

## Invitation to take part in research

Hi, my name is Davina Chauhan and I would like to invite you to take part in my research study. I am a student at the University of Edinburgh and am trying to find out what is important to teenagers, if they do the things that are important to them, and if this affects how they feel.

**Why are you doing this study?**

I hope that this research will help adults to understand teenagers better, especially adults you might go to for help if you have problems with your health or how you are feeling, like psychologists, doctors, nurses and guidance teachers.

**What would I have to do?**

If you would like to take part, you will be asked to complete five questionnaires at school at the same time as other people in your class. There will also be a form to complete asking for your age, gender and postcode but not your name. It is not a test and there are no right or wrong answers. You may also be asked to complete two of these questionnaires again on another day at school.

**When will this study be taking part?**

[*local information, including which class data will be collected in and the teacher's name*]

**Could anything bad happen if I take part?**

I hope that you will find the questionnaires interesting as they are all about what you think, feel and do. However, it is possible that you may find some of the questions upsetting, especially if you are having some difficulties with your feelings. If this happens, there are people you can talk to. You could speak to your parents, a teacher or nurse at school, or your GP. The website http://www.moodjuice.scot.nhs.uk/ has lots of helpful information about feelings. Other people who might also be able to help include Childline http://www.childline.org.uk/ who have an online chat system and a free phone number 0800 1111; NHS 24 have a free phone number 111; and Breathing Space http://www.breathingspacescotland.co.uk/ 0800 83 85 87.

**Do I have to take part?**

No, it is up to if you take part or not. I have also sent a letter to your parents/guardians to let them know about this study so you might want to talk to them about it. If you don't want to take part, you can ask your parents to complete

the opt-out form, or tell the teacher on the day. If you decide to take part, you can also change your mind at any stage.

**What will you do with my information?**

You do not need to put your name on any of the questionnaires so all your information will be unidentifiable (no-one will be able to tell who you are from these forms). I will be entering all of the information on a computer and it will be stored safely on the university's systems. The paper copy will then be destroyed. After 10 years, my supervisors and I will decide if the digital data should be kept for longer or deleted and we will review this every 5 years after that. I will use the results for my coursework. My supervisors and I might also want to look at the information in more detail after I have finished my course. It is likely we will publish the results in a scientific journal to let other people know what we found. It is also possible that other researchers would like to look at the information from the questionnaires to help with their own research in the future.

**Will I get to know the results?**

You will be given a separate form to write down your email address if you would like a summary of the results. You can still take part even if you don't want to give your email address. Because I am asking lots of teenagers to take part, it may be between a few months to over a year before the results are available. I will not share your email address with anyone else and will only use it to tell you about the results of this study.

**What if I have any questions?**

Please email me at d.chauhan@sms.ed.ac.uk if you have any questions at all about this research. No question is too silly!

**Thank you for taking the time to read this information sheet.**

**Information sheet for parents/guardian regarding a research study**

Dear Parent/Guardian

My name is Davina Chauhan and I'm a trainee clinical psychologist studying at the University of Edinburgh. I am inviting your child to take part in a study at school, and am asking for your consent. Please take some time to read through this sheet to find out some important information about the study. There is also an information sheet for your child to read.

**Title**

Values, values-consistent behaviour and wellbeing in adolescents

**Why are you doing this study?**

The aim of the study is to explore what teenagers value, whether they do things that are important to them, and if this affects their wellbeing. This research may help adults to understand teenagers better, especially health and mental health professionals, such as psychologists, doctors, nurses and guidance teachers.

**Why has my child been invited?**

Invitations are being sent out to several hundred teenagers aged between 13 and 17 with permission from the head teacher of their school. Some schools may have agreed to only some classes taking part, so if you have another child aged 13-17 at the same school, they will receive a separate letter if they are also being invited to take part. As well as having the head teacher's permission for this study to go ahead, it has been approved by [*insert local information*] and the University of Edinburgh's School of Health in Social Science research ethics committee.

**What would my child have to do?**

If your child would like to take part and you are happy for them to do so, they will be asked to complete five questionnaires at school in class time. There will also be a form to complete asking for their age, gender, and postcode but not their name. They may also be asked to complete two of these questionnaires again on another day at school on a date agreed with the school.

**When will this study be taking part?**

[*local information, including which class data will be collected in and the teacher's name*]

**Are there any risks to taking part?**

I hope that your child will find the questionnaires interesting. However, it is possible that they may find some of the questions upsetting, especially if they are having some difficulties with their feelings. I have provided details of sources of support on the information sheet for teenagers. If you are worried about your child's health or wellbeing, please take them to a GP or contact NHS 24 on 111.

**Who will be collecting the information?**

The questionnaires will be completed in class time and instructions will either be given by me or the teacher, depending on what is agreed with the school. As well as studying at the University of Edinburgh, as part of my training, I am employed by NHS Lothian and have had an Enhanced Disclosure check by the Protecting Vulnerable Groups Scheme, which is required for working with children, teenagers, and other vulnerable groups.

**Do they have to take part?**

No, it is up to your child if they take part or not. If they decide to take part, they can change their mind at any stage. I hope that you will discuss this study with your child. If they don't want to take part, you can complete the opt-out form and send it back to me using the prepaid envelope provided, or they can tell the teacher on the day. If you do not want them to take part, it might be helpful to talk to your child about this as other children may be taking part whilst they are in class. If you are happy for your child to take part, no further action is required.

**What will you do with the information?**

All data will be anonymous and confidential in accordance with the Data Protection Act 1998. No names will be collected on the questionnaires so all information will be unidentifiable (no one will be able to tell from the questionnaires that your child completed them). I will be entering all of the information on a computer and it will be stored safely on the university's systems to allow for any necessary governance checks. The paper copy will then be destroyed. After 10 years, my supervisors and I will decide if the digital data should be kept for longer or deleted and we will review this every 5 years after that. I will use the results for my coursework. My supervisors and I might also want to look at the information in more detail after I have finished my course. It is likely we will publish the results in a scientific journal to let other people know what we found. It is also possible that other researchers would like to look at the information from the questionnaires to help with their own research in the future.

**Will I get to know the results?**

You child will be given a separate form to write down their email address if they would like a summary of the results. They can still take part even if they don't provide an email address. I will not share their email address with anyone else and will only use it to tell them about the results of this study. Due to the size of the study, it may be between a few months to over a year before the results are available. Your child's individual results cannot be fed back to you or to them as the information is non-identifiable.

**What if I have any questions?**

Please email me at d.chauhan@sms.ed.ac.uk if you have any questions at all about this research. No question is too silly!

**Thank you for taking the time to read this information sheet.**

## Appendix C – Opt-out form

**Opt-out form for research study**

Please complete this form only if you do **not** want your child to take part in the study

Researcher's name: Davina Chauhan

Research institution: University of Edinburgh

Study: Values, values-consistent behaviour and wellbeing in adolescents

**I do not want my child to take part in this research study.**

Child's name:

Class teacher's name (please see the information sheet for details of which class the study will be happening in):

Parent/Guardian's name:

Parent/Guardian's signature:

Date:

Once complete, please return this form in the prepaid envelope provided.

## Appendix D - Data coding for invalid responses

For all questionnaires, if the participant had ticked between two adjacent response options or written a response indicating a failure to choose between two adjacent valid responses (e.g. 4.5 or 4/5), data were entered for the lower of the two ratings. For items where two non-adjacent options had been selected, data were entered as missing. For the VLQ-2, a response of 0 (which occurred at least once for 39 participants (41.5%)) was entered as 1. For the WEMWBS, a large tick crossing the response spaces for two adjacent items (in place of one tick per item) was coded as the same response for both items.

## Appendix E – Missing data across questionnaires

Rates of missing data per item for each measure

| | **Missing data per item (N=94)** | **Participants with no data** | **Participants with 50-100% data missing (excluded from analyses)** |
|---|---|---|---|
| **WEMWBS** | 9-12 (9.6%-12.8%) | 8[a] | 9 |
| **VLQ-2** | 4-12 (4.3%-12.8%) | 4[b] | 4 |
| **PVQ-RR** | 0-6 (0-6.4%) | 0 | 1 |
| **AFQ-Y8** | 6-7 (6.4%-7.4%) | 6[c] | 6 |
| **CAMM** | 6-7 (6.4%-7.4%) | 6[d] | 6 |
| **VLQ-2 (retest)*** | 40-43 (42.6%-45.7%) | 40 | 41 |
| **PVQ-RR (retest)*** | 39-41 (41.5%-43.6%) | 39[b] | 39 |

NB. WEMWBS = Warwick-Edinburgh Mental Well-being Scale, VLQ-2 = Valued Living Questionnaire 2, PVQ-RR = Portrait Values Questionnaire Second Revision, AFQ-Y8 = Avoidance & Fusion Questionnaire for Youth Short Form, CAMM = Child & Adolescent Mindfulness Measure.

[*] Not all participants were asked to complete the retest, and some collected data were unusable.

[a] An administration error led to the page with the WEMWBS missing from a number of questionnaire packs. This accounts for all of the participants with no WEMWBS data.

[b] One of these participants was also missing WEMWBS data.

[c] The same six participants had no AFQ-Y8 and CAMM data.

[d] All participants who had no PVQ-RR retest data also did not have VLQ-2 data

## Appendix F - Missing data on the Valued Living Questionnaire 2 at stage 1

| *N=94* | **Possibility** | **Current Importance** | **Overall Importance** | **Action** | **Satisfaction with Action** | **Concern** | Total by value domain |
|---|---|---|---|---|---|---|---|
| **Family** | 5 | 4 | 4 | 4 | 5 | 5 | **27 (4.8%)** |
| **Marriage/relationships** | 5 | 5 | 5 | 5 | 7 | 6 | **33 (5.9%)** |
| **Parenting** | 5 | 5 | 5 | 5 | 6 | 6 | **32 (5.7%)** |
| **Friends** | 5 | 5 | 6 | 6 | 6 | 7 | **35 (6.2%)** |
| **Work** | 9 | 9 | 9 | 9 | 10 | 10 | **56 (9.9%)** |
| **Education** | 5 | 5 | 5 | 5 | 6 | 7 | **33 (5.9%)** |
| **Recreation** | 8 | 7 | 7 | 7 | 8 | 8 | **45 (8.0%)** |
| **Spirituality** | 12 | 10 | 11 | 10 | 11 | 10 | **64 (11.3%)** |
| **Community Life** | 11 | 10 | 10 | 10 | 11 | 10 | **62 (11.0%)** |
| **Physical self-care** | 7 | 6 | 6 | 6 | 7 | 6 | **38 (6.7%)** |
| **Environment** | 7 | 6 | 6 | 6 | 8 | 6 | **39 (6.9%)** |
| **Aesthetics** | 9 | 8 | 8 | 8 | 10 | 9 | **52 (9.2%)** |
| Total by level | **98 (8.7%)** | **80 (7.1%)** | **82 (7.3%)** | **81 (7.2%)** | **95 (8.4%)** | **90 (8.0%)** | |

## Appendix G - Author guidelines for *Quality of Life Research*

Full-Length Original Articles

Original articles are a maximum of 4,000 words, exclusive of a 250-word structured abstract, figures, tables, and references. We are particularly interested in studies that utilize patient-reported outcomes, focusing on clinical and policy applications of quality-of-life research; showcasing quantitative and qualitative methodological advances; and / or describing instrument development.

Title Page

The title page should include:

- The name(s) of the author(s)
- A concise and informative title
- The affiliation(s) and address(es) of the author(s)
- The e-mail address, telephone and fax numbers of the corresponding author

Abstract

Please provide a structured abstract of 150 to 250 words which should be divided into the following sections:

- Purpose (stating the main purposes and research question)
- Methods
- Results
- Conclusions

Keywords

Please provide 4 to 6 keywords which can be used for indexing purposes.

Text Formatting

Manuscripts should be submitted in Word.

- Use a normal, plain font (e.g., 10-point Times Roman) for text.
- Use italics for emphasis.
- Use the automatic page numbering function to number the pages.
- Do not use field functions.
- Use tab stops or other commands for indents, not the space bar.
- Use the table function, not spreadsheets, to make tables.
- Use the equation editor or MathType for equations.
- Save your file in docx format (Word 2007 or higher) or doc format (older Word versions).

Manuscripts with mathematical content can also be submitted in LaTeX.

- LaTeX macro package (zip, 182 kB)

Headings

Please use no more than three levels of displayed headings.

Abbreviations

Abbreviations should be defined at first mention and used consistently thereafter.

Footnotes

Footnotes can be used to give additional information, which may include the citation of a reference included in the reference list. They should not consist solely of a reference citation, and they should never include the bibliographic details of a reference. They should also not contain any figures or tables.

Footnotes to the text are numbered consecutively; those to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data). Footnotes to the title or the authors of the article are not given reference symbols.

Always use footnotes instead of endnotes.

Acknowledgments

Acknowledgments of people, grants, funds, etc. should be placed in a separate section on the title page. The names of funding organizations should be written in full.

Citation

Reference citations in the text should be identified by numbers in square brackets. Some examples:

1. Negotiation research spans many disciplines [3].

2. This result was later contradicted by Becker and Seligman [5].

3. This effect has been widely studied [1-3, 7].

Reference list

The list of references should only include works that are cited in the text and that have been published or accepted for publication. Personal communications and unpublished works should only be mentioned in the text. Do not use footnotes or endnotes as a substitute for a reference list.

The entries in the list should be numbered consecutively.

- Journal article

  Harris, M., Karper, E., Stacks, G., Hoffman, D., DeNiro, R., Cruz, P., et al. (2001). Writing labs and the Hollywood connection. Journal of Film Writing, 44(3), 213–245.
- Article by DOI

  Kreger, M., Brindis, C.D., Manuel, D.M., & Sassoubre, L. (2007). Lessons learned in systems change initiatives: benchmarks and indicators. American Journal of Community Psychology. doi:10.1007/s10464-007-9108-14.
- Book

  Calfee, R. C., & Valencia, R. R. (1991). APA guide to preparing manuscripts for journal publication. Washington, DC: American Psychological Association.
- Book chapter

  O'Neil, J. M., & Egan, J. (1992). Men's and women's gender role journeys: Metaphor for healing, transition, and transformation. In B. R. Wainrib (Ed.), Gender issues across the life cycle (pp. 107–123). New York: Springer.
- Online document

  Abou-Allaban, Y., Dell, M. L., Greenberg, W., Lomax, J., Peteet, J., Torres, M., & Cowell, V. (2006). Religious/spiritual commitments and psychiatric practice. Resource document. American Psychiatric Association. http://www.psych.org/edu/other_res/lib_archives/archives/200604.pdf. Accessed 25 June 2007.

Journal names and book titles should be italicized.
For authors using EndNote, Springer provides an output style that supports the formatting of in-text citations and reference list.

- EndNote style (zip, 3 kB)

Tables

- All tables are to be numbered using Arabic numerals.
- Tables should always be cited in text in consecutive numerical order.
- For each table, please supply a table caption (title) explaining the components of the table.

- Identify any previously published material by giving the original source in the form of a reference at the end of the table caption.
- Footnotes to tables should be indicated by superscript lower-case letters (or asterisks for significance values and other statistical data) and included beneath the table body.

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